JUNE 8, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

If We Have Steel Strike, Users' Woes Will Start after 30 Days

Socialist Target: British Steel

New Products Are Key to Growth

More U. S. Industry Moves Abroad

How Positioning Equipment Cuts Work Time on Weldments

Steel Islands: Market Is Reborn

Aluminum's on the Move

The success story of the second most used metal is still unfolding because it's still as modern as tomorrow. Special 16 page study covers trends in production, uses, fabrication, plus a 3000-company market survey, Page 103

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METALWORKING OUTLOOK
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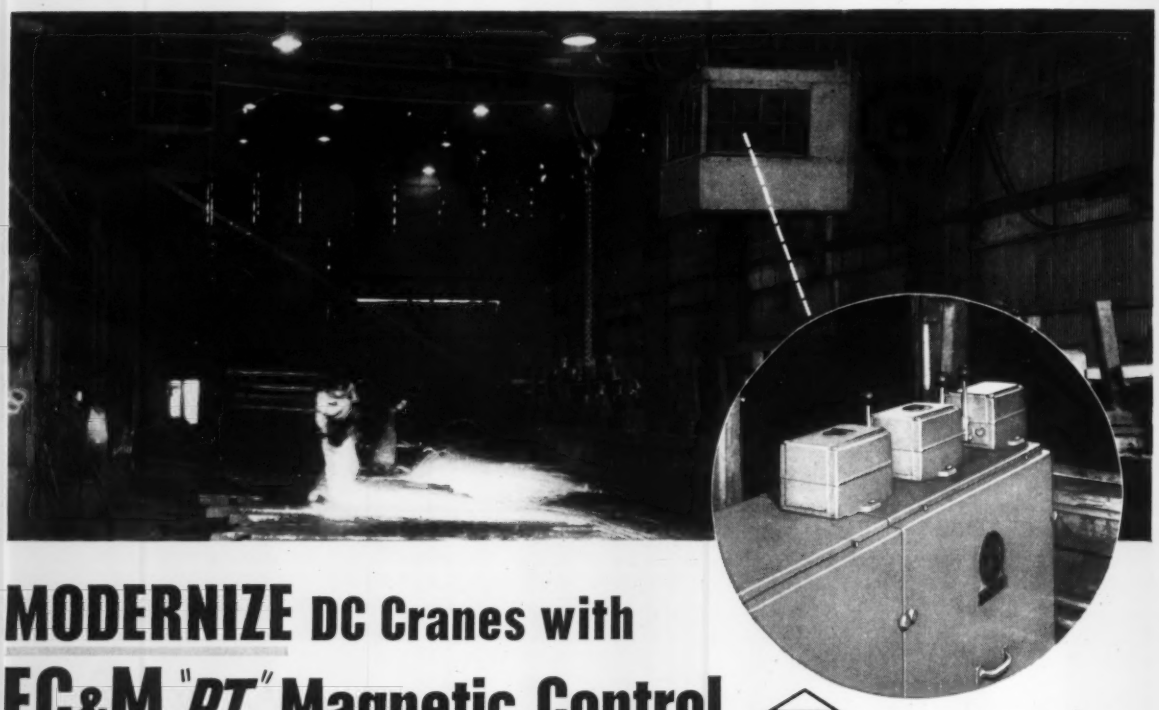


MODERNIZE DC Cranes with EC&M "PT" Magnetic Control

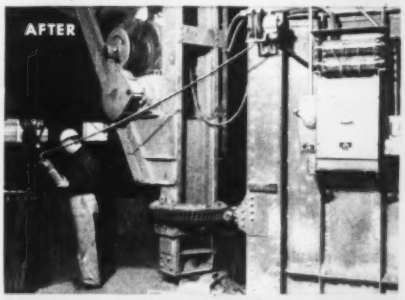
Three-motion crane serving scarfing area in mid-western steel plant uses "PT" control for bridge, trolley and hoist motions. EC&M Tab-Weld resistors are mounted on bridge foot-walk. Two "PT" controllers, replacing manual controllers, are mounted at front of cab. Third controller is at rear of cab, and all three master switches are up front within easy reach of operator. Since converting to "PT" control, there is more room in cab.

Is *manual* control penalizing crane operation in your plant? Are motors and machine subjected to abnormal conditions during acceleration and plugging? Is output affected by the slower reaction of operators as they tire under the strain of manual control on an all-day's run?

EC&M "PT" Magnetic Control erases these deficiencies. Timed acceleration and rectifier-plugging protection cuts motor abuse. Compact, easy-operating master switches provide a new "feel", enabling the operator to increase output.

The illustrations shown here are typical of the acceptance of EC&M "PT" control for DC Cranes. One plant has a modernization program under way involving dozens of cranes. Physically, "PT" control occupies about the same space as manual control. The cost is comparable, too.

Convert now to "PT" control. This *magnetic* control is far superior to manual control.



Jib crane, shown at top with old manual controller, is now operated by "PT" magnetic control (bottom). Pendant pushbutton provides remote control, gives operator better view of open hearth floor. "PT" control can be operated, without change, by either master switches or pendant pushbutton. "PT" control is front wired, front accessible, for mounting against walls or crane girders.

Write for complete details on "PT" crane control. Ask for Bulletin 6131.

2950

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

WHEREVER ELECTRICITY IS DISTRIBUTED AND CONTROLLED

This Week in STEEL

The Metalworking Weekly

June 8, 1959 Vol. 144—No. 23

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Aluminum's on the Move—A special STEEL report for managers who keep up with progress in technology 103

This 16 page study is the third in the Trends in Metals series. It covers production and distribution, uses, and fabrication of aluminum, plus results of a survey among metalworking executives.

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Index available semiannually.

STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Metalworking Pulse ▶ TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED MAY 30	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Based on steel output, electric power output, freight carloadings, auto assemblies	166*	172	167	125

*Preliminary.

After setting an all-time high of 172 (1947-49=100), STEEL's industrial production index slipped 6 points as the result of the Memorial Day holiday. But this was less than the average holiday dip over the last six years.

Details on Page 81

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED JUNE 6	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	120,000*	117,470†	134,763	73,696

*Estimated. †Preliminary.

Despite the holiday decline in production, automakers built about 546,500 cars last month. Production last week still reflected the Memorial Day weekend, but the rest of the month should follow the May pattern.

Details on Page 78

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED JUNE 7	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	2,674*	2,650	2,604	1,685
Index (1947-49=100)	166.5*	165.0	162.1	104.9
Percentage of capacity	94.0	94.5	94.5	60.5

*Estimated.

Mills have produced 2.6 million tons or more of steel ingots and castings for 13 consecutive weeks. That figure was first attained in mid-March. Record pace may be slowed soon by strike-precautionary shutdowns.

Details on Page 144

STEEL SCRAP PRICE COMPOSITE

	JUNE 3	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$35.00	$34.00†	$33.67	$36.17

†Revised.

STEEL's composite on No. 1 heavy melting steel scrap rose $1 a ton to $35, augmenting the gain registered in the previous week. The market is especially strong on the East Coast where exports have reduced supplies.

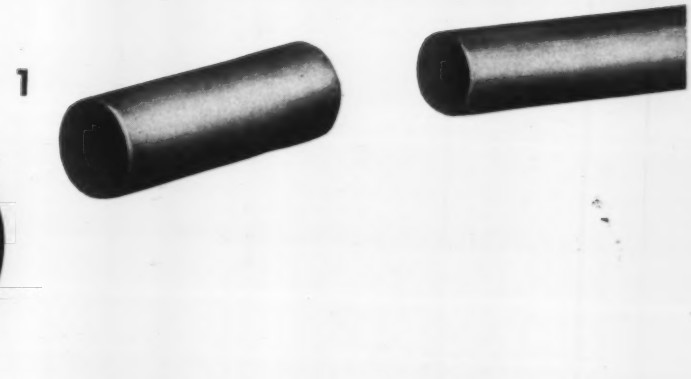
Details on Page 156

FINISHED STEEL PRICE INDEX

	JUNE 2	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	181.6

A firm price level is being maintained in the finished steel market as buyers take all tonnages produced. Outcome of labor contract negotiations will be key to changes this summer, if any, in price schedules.

Details on Page 145



Making case-hardened balls from cold-heading wire

Changing a length of straight steel wire into a precision-finished bearing ball might seem like fitting a square peg into a round hole. Yet that's the way case-hardened balls are made, and with the proper type of Bethlehem ball-quality wire the results are gratifying indeed.

The trick really lies in producing the right wire for this severe heading operation, along with the dry grinding, hardening, tumbling, and finishing steps that follow. Bethlehem cold-heading quality wire passes these tests with flying colors.

In fact, Bethlehem wire has performed consistently for a wide variety of cold-headed parts, from rivets and screws to complicated custom-headed items. You can depend on Bethlehem wire to be uniform in quality, temper, and finish. Most important, you can count on Bethlehem to furnish the *right* steel wire for your job. Let us know if we can help you with any wire problem you may have. Just call our nearest district sales office.

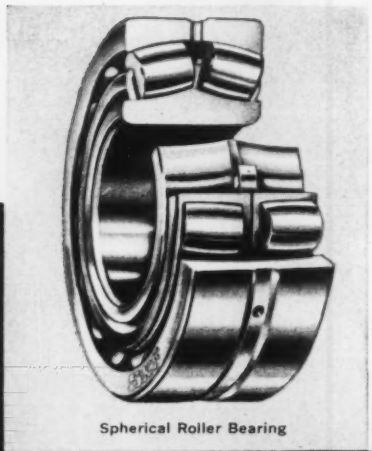
Steps in making a case-hardened ball: 1. Wire cut to size. 2. Cold-head. 3. Grind. 4. Harden and Tumble. 5. Finish.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

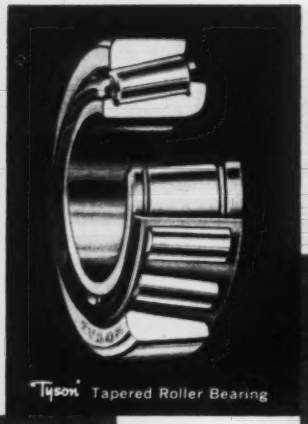
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

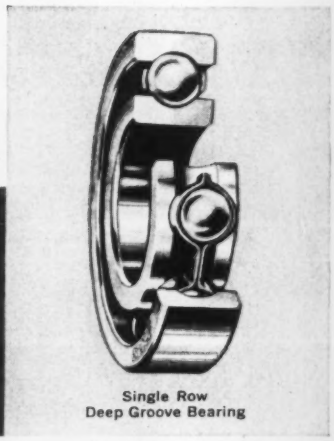


Spherical Roller Bearing

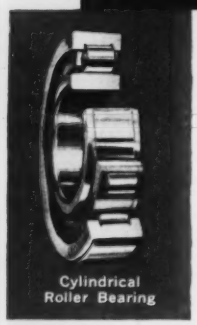


"Tyson" Tapered Roller Bearing

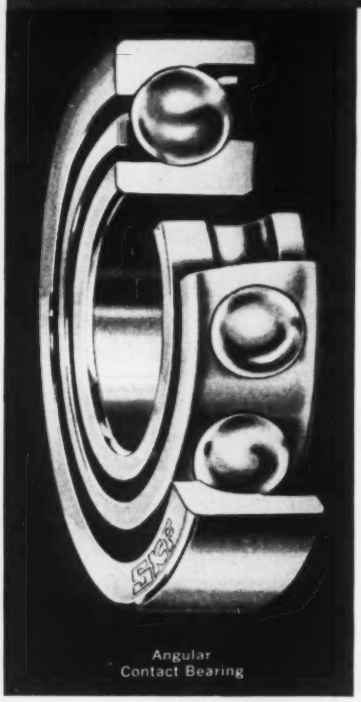
Spherical Roller Thrust Bearing



Single Row
Deep Groove Bearing



Cylindrical
Roller Bearing



Angular
Contact Bearing

When can a standard bearing do a "special" job?

Suppose you need a high speed bearing to support either heavy thrust load or thrust load combined with radial load. It is almost a certainty that SKF angular contact ball bearings will do the job.

SKF bearings of this type are produced in bore sizes ranging from ¾" to just over 7". They lend themselves to all sorts of mountings. For example, you can mount them in pairs either face-to-face or back-to-back where axial rigidity and high radial capacity are needed. Or you can mount two or more bearings in tandem, where a particularly high thrust capacity is required.

Yet this is a standard SKF bearing, promptly available in over 80 sizes of single- and double-row types.

Almost every SKF bearing can do "special" jobs for you. Why not find out how they'd be more efficient and economical? Call any one of the twenty-five sales offices.

5924

Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

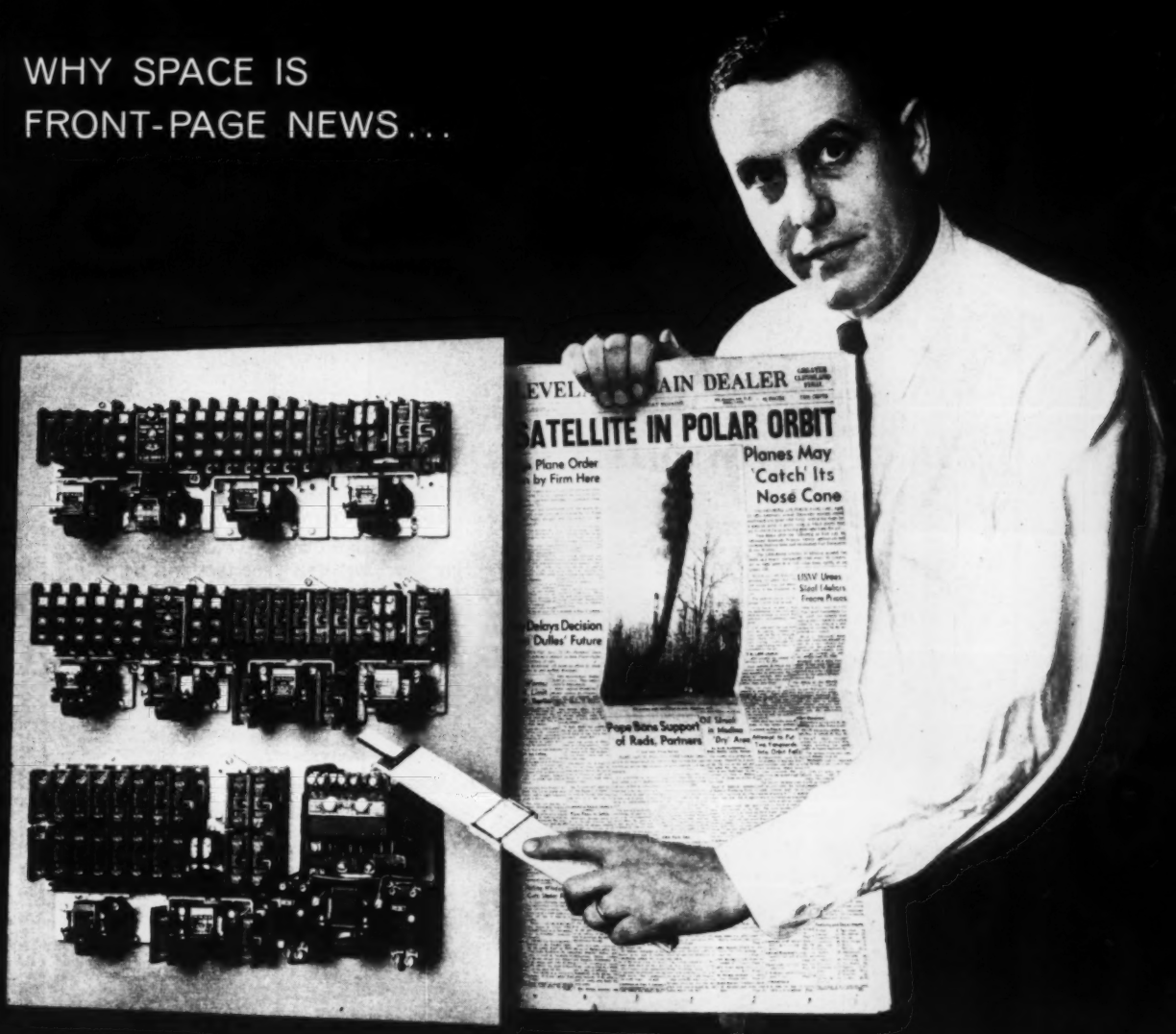
EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES INC. PHILADELPHIA 32, PA

®REG. U. S. PAT. OFF.

WHY SPACE IS
FRONT-PAGE NEWS...



Compact Clark Relays control 72 circuits from panel area smaller than a newspaper

In this day of space exploration and space economy, it's news—front page news—when you can get 72 separate, controlled circuits all on a panel no larger than 15" x 20".

Clark Controller, with the most complete and integrated line of control relays available today—convertible pole, latch, universal pole, and time delay—does it! And only Clark offers such a wide range of operation, so many contacts, in a panel area of such small size.

Shown mounted here with the Clark Size 1, Type "CY" Starter are 10 compact Clark Relays which include four time delay contacts (two normally open, two normally closed), 52 instantaneous contacts (14 normally open, 14 normally closed, and 24 convertible), plus 16 latching contacts (all convertible).

The same engineering leadership and superior workmanship that made Clark Controller the *standard of quality* for controls in heavy industry, is inherent in the broad line of Clark Relays for modern panels.

The "modular construction" of all Clark "PM" Relays insures integrated uniformity, compactness and flexibility. Functional alignment in mounting results in neater, more uniform panels and most efficient utilization of valuable space. And because "PM" relays are available in a wide variety of pole combinations, providing up to 14 contacts on a single relay, you can control more circuits—save on relay requirements.

For more information on the complete line of Clark "PM" Relays which is making space-saving headlines, contact your nearest Clark Controller sales office or distributor. Or, write direct to Clark Controller for free bulletins.

The **CLARK CONTROLLER** *Company*

Everything Under Control • 1146 E. 152nd St. • Cleveland 10, Ohio

IN CANADA: CANADIAN CONTROLLERS, LIMITED • MAIN OFFICES AND PLANT, TORONTO

You'll "Count your Blessings" in increased profits and production

when you count on Veeder-Root

Veeder-Root Counters on all production machines and processes will help you to:

Keep closer *Count*rol of manufacturing

Coordinate output of parts and components

Keep up to delivery dates

Keep closer *Count*rol of wage and incentive payments, piece work and payrolls

Avoid costly errors, waste, shortages

Anticipate maintenance needs

Veeder-Root makes all types of counters . . . manual, mechanical, electro-magnetic, electronic . . . to count anything at any speed. What do *you* need to count? We'll figure the way to do it.

You always "Know the score" when you count on Veeder-Root!

PANEL-MOUNTED ELECTRICAL COUNTER

Widely used for remote indication . . . can be grouped on panels in office. Speeds up to 1,000 counts per minute. Knob or lock-key reset. 6 figures. Also, base-mounted if desired.

Everyone can Count on

Veeder-Root INC.

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New York • Los Angeles • San Francisco • Montreal
Offices and Agents in Principal Cities

STEEL Takes a Bow

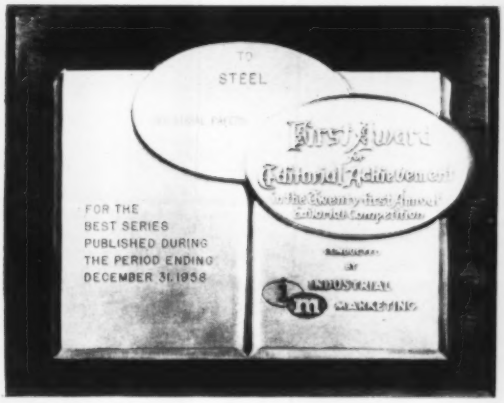
Word from Chicago, the headquarters of *Industrial Marketing* magazine, shows that STEEL is again a multiple award winner in *IM*'s editorial competition.

A letter to STEEL's editor, Walt Campbell, from *IM*'s managing editor, Leo Anderson, tells the tale:

"Congratulations! STEEL has won a first place plaque (shown below) for best series of articles, ('Cost Crisis . . . How to Beat It') and two certificates of merit. One is for outstanding original research ('Metal Selector—1958') and the other is for an outstanding single issue ('1958 Yearbook —Year of the Marketeer') . . . in the industrial publication category.

"This year there were 555 entries in the competition. So you can see you had to be good to win. A group of 28 distinguished judges picked the winners . . ."

You'll pardon our almost immodest pride, but we think this is quite something. In the 1958 competition, STEEL won more awards than any other publication and now holds 28, more than double the number garnered by any other metal-working magazine.



Caught on a Cloverleaf

The opening of this department can be likened to traveling a new highway. The road signs are in place, we know the route, the secondary roads, and that the traffic is between you, the reader, and us, the editors. All we need is a name for our vehicle.

Remember, the reader submitting the best name for this department will be given a handlettered card proclaiming him STEEL's Honorary Editor No. 1. Official chistening will depend upon your entries. A post card will do.

Designer at Work

Seated behind this scale model of the Firebird III is William L. Mitchell, General Motors vice president in charge of styling. His experimental lab staff made the models expressly for STEEL's Beat-the-Experts contest.

You can win one by correctly guesstimating the number of cars that will be produced in the U. S. from Jan. 1 through Dec. 31, 1959. If you entered the contest with a coupon from the June 1 issue, please submit another entry. The coupon erroneously called for production during the last six months of the year.

The ten next-best-guessers will receive full-color prints of a dream car rendering by George W. Walker, Ford vice president and director of styling. The contest closes at midnight, June 30, 1959. In case of ties, the earliest postmark will determine the winner.

We Get Kudos . . .

H. E. Carson, advertising manager, Niagara Machine & Tool Works, Buffalo, gave thoughtful consideration to private eye Acton Chance's ar-

I believe _____ automobiles will be produced in the U. S. from Jan. 1 through Dec. 31, 1959.

Mail this to:
Ed Service
Beat-the-Experts
STEEL
Penton Bldg.
Cleveland 13,
Ohio

PRINT NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____

IT'S MACHINE 'TUNE-UP' TIME

How long have your Ex-Cell-O production machines been in continuous operation? Even the most reliable equipment will run faster . . . more accurately and *longer* after a thorough going-over by skilled Ex-Cell-O machine repairmen.

Necessary replacement parts are Ex-Cell-O "original equipment" quality; re-wiring conforms to JIC standards; tables and ways are hand-scraped to their level best; coolant and lubricant systems are restored to full efficiency, spindles are trued, and tooling can easily be up-dated to your specifications.

Call your local Ex-Cell-O Representative, or write direct for details on how older Ex-Cell-O machines can be economically "tuned" to today's production needs.

59-42

XLO EX-CELL-O FOR PRECISION

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

ticles: "The Case of the Vanishing Jobs" and "The Case of the Vanishing Taxes." Says Reader Carson: ". . . this is a serious situation. The more you can editorialize on the 'Vanishing Taxes,' bringing it to the attention of our people in Washington, in particular, the faster we will get somewhere. I am convinced that Washington officials are really apathetic toward the matter of foreign competition . . ."

. . . And Light Umbrage

Reader Carson also says: "In view of the gravity of the situation and the quality of the content of the articles, we were quite disappointed to read: 'these thoughts occurred to the writer between bourbons.' We can appreciate your trying to inject an element of stage setting into your presentation . . . but (such remarks) . . . degrade the article, robbing it of much of its real impact."

We appreciate your points of view, Reader Carson. You're right, we did try to dramatize the stories because we felt they should receive the widest possible distribution. Also, we deplore Acton's drinking habits and even his roving eye—but gad, what a reporter!

As to prodding Washington officials out of their lethargy, our Washington editor, Jack Botzum, says that directors of federal agencies have evinced interest in the articles.

Meeting Foreign Competition

Looming next to Editor Walt Campbell is evidence of one of the most important problems facing American business: It's the good ship *Filleigh*. Registry, London; cargo, steel from western Europe; location, she's moored at the mouth of the Cuyahoga River, in Cleveland's harbor—just about a mile from the mills of domestic companies which produce exactly the same products that were unloaded: Fencing, wire, channels, angles, rods, reinforcing bars, and round bars.

Editor Campbell was doing a little on the scene researching for next week's article: "Meeting Foreign Competition," the fifth article in the Program for Management series for 1959.

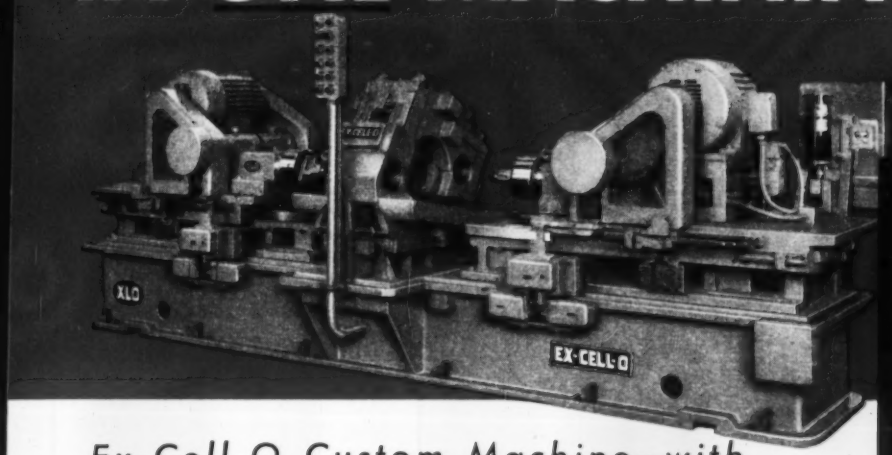
FROM ROUGH...

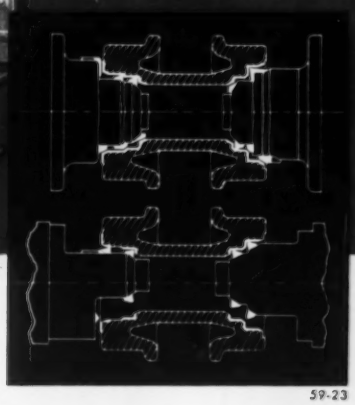
Heavy boring and plunge-facing

TO FINISH

Precision boring and facing

IN ONE MACHINING CYCLE





59-23

Ex-Cell-O Custom Machine—with quick-change tooling—speeds output of large, cast-iron track rollers

This Ex-Cell-O Custom Machine features precision—in a big way.

A track roller for rugged, off-the-road equipment, is clamped in the hydraulically-actuated fixture; the rest—from rough to finish—is automatic.

The part is first rough-bored on both ends at the same time. Then both slides retract and the fixture indexes into position for finish boring and facing at both ends, simultaneously. (Drawing, above-right, shows rough and finish tooling.) Slides again retract and the fixture is unclamped, ready for the next cycle. Easily changed tooling heads and clamping jaws permit precision machining of any of three similar components with minimum lag in production.

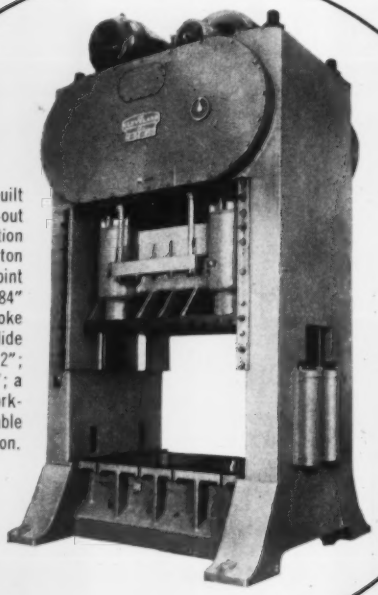
See your Ex-Cell-O Representative, or write direct for full details on Ex-Cell-O Custom Machines—specially designed with extended capacity for changing production needs.

EX-CELL-O FOR PRECISION XLO

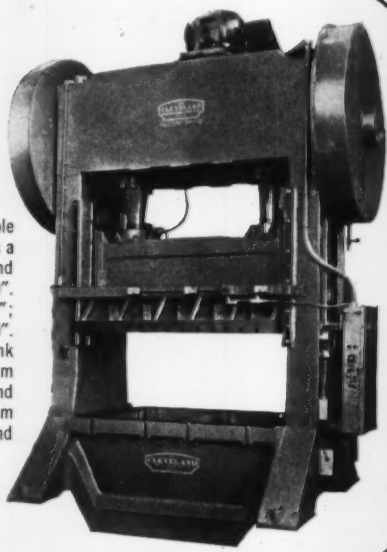
EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

Machinery Division

EX-CELL-O PRECISION PRODUCTS INCLUDE: MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • TORQUE ACTUATORS • THREAD AND GROOVE GAGES • GRANITE SURFACE PLATES • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT



Ruggedly built for day-in, day-out steady production—this 400-ton Cleveland 4-point Press has a 60 x 84" bed area; stroke of slide, 18"; slide adjustment, 12"; shut height, 54"; a dependable workhorse for profitable production.



This 300-ton Straight-Sided Double Crank Press has a 60 x 84" bed area and shut height of 40". Stroke of slide, 18"; Slide adjustment, 10". This double crank press offers maximum accuracy and die life—minimum maintenance and per-part cost.

SINCE 1880

CLEVELAND PUNCH & SHEAR WORKS CO.

Pioneers in Cost-Cutting Metalworking Presses, Fabricating Tools.

Here's how they pay for themselves!

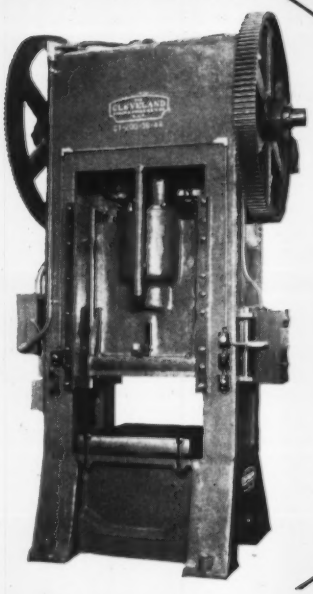
CLEVELAND PRESSES

INCREASED PRODUCTION • ECONOMY OF OPERATION • MINIMUM MAINTENANCE

Each of these Cleveland Presses features the patented Cleveland Drum Type Friction Clutch—easily adjusted, uses less power, assures minimum down-time. For lower operating costs, it provides quicker starting and stopping to boost production.

For proven metalworking economy, Cleveland has 12 different types of presses: Inclinable, Horning, Gap, Trimming, Knuckle-Joint, Toggle, Straight Sided Crank, Straight Sided Eccentric, Single Point, Two Point, Four Point, and Four Point Underdrive—each in a wide range of capacities, bed areas, stroke of slide, etc. Investigate how you get BETTER stampings for LESS with a Cleveland Press.

AA-9618



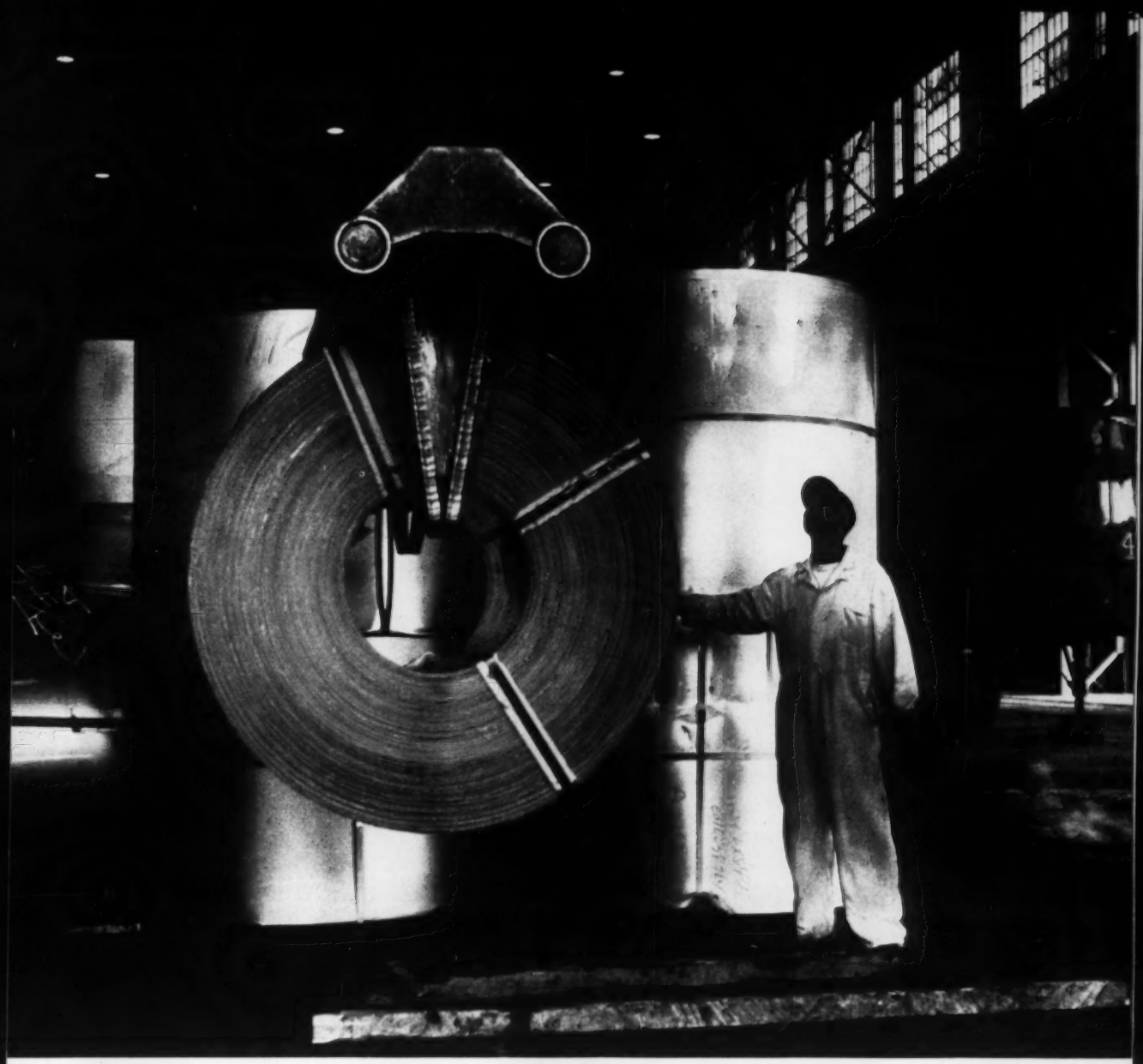
This Cleveland 200-ton Straight Sided Single Crank Press is ruggedly built to meet your trimming, blanking, drawing and other press needs. Bed area, 42 x 36"; stroke of slide, 12"; slide adjustment, 6"; shut height, 26".

THE CLEVELAND PUNCH & SHEAR WORKS CO. U.S.A.

Established 1880

Power Presses
Fabricating Tools
Punching Tools & Dies

E. 40th and St. Clair Avenue, Cleveland 14, Ohio



INSTANT STEEL

A CALL TO YOUR LOCAL STEEL DISTRIBUTOR ENDS IN-PLANT SHORTAGES FAST!

Emergency? Your steel service center can end it in a hurry with practically any amount, quality, size or shape of steel you may need. No more in-plant steel shortages—no more plant shutdowns—no more lost contracts.

Or you may choose to use his facilities, stocks and fast delivery service on a regular basis. Whatever your production needs, your local steel distributor is on hand ready to give instant service. All you have to do is phone.

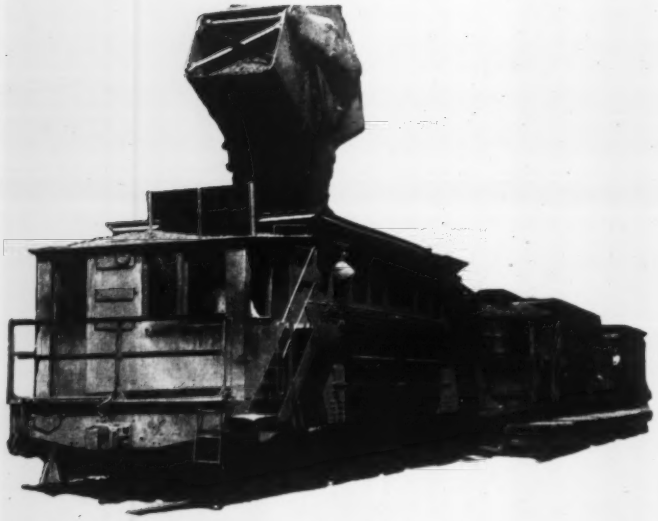
Call him for any quantity of Weirkote continuous-process zinc-coated sheets, Weirzin electrolytic zinc-coated sheets, hot- or cold-rolled sheets or any type of steel you may need for any type of production job.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION



day in – day out
DEPENDABILITY

ATLAS

Atlas cars like the 75-ton ore transfers above are built to the individual load and schedule of each user. This custom engineering method, with matching care in manufacturing, assures dependable service incorporating all approved personnel safety features.

Since 1896 designers and builders of Ore Transfers . . . Scale Cars . . . Coke Quenchers . . . Coal Larries . . . Door Machines . . . Safety-Type Transfers . . . Storage Battery Locomotives

ATLAS CAR & MFG. COMPANY
1140 IVANHOE ROAD
CLEVELAND 10, OHIO

CALENDAR
OF MEETINGS

June 9-12, Material Handling Institute Inc.: National exposition of material handling equipment, Public Auditorium, Cleveland. Institute's address: 1 Gateway Center, Pittsburgh 22, Pa. Managing director: L. West Shea.

June 11-12, Pressed Metal Institute: Sales conference, Bedford Springs Hotel, Bedford, Pa. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

June 13-15, Metal Powder Industries Federation and Powder Metallurgy Committee of the Metallurgical Society, AIME: International conference on powder metallurgy, Hotel Biltmore, New York. Information: Metal Powder Industries Federation, 130 W. 42nd St., New York 36, N. Y.

June 14-16, National Association of Metal Finishers: Annual meeting, Statler-Hilton Hotel, Detroit. Association's address: 60 Bently Rd., Cedar Grove, N. J. Executive secretary: P. Peter Kovatis.

June 14-17, National Association of Purchasing Agents: Annual meeting and exhibit, Waldorf-Astoria Hotel, New York. Association's address: 11 Park Place, New York 7, N. Y. Executive secretary: G. W. H. Ahl.

June 14-17, National Industrial Advertisers Association: Annual meeting, Fairmont and Mark Hopkins Hotels, San Francisco. Association's address: 271 Madison Ave., New York 16, N. Y. President: John C. Freeman.

June 14-18, American Society of Mechanical Engineers: Semiannual meeting, Chase-Park Plaza Hotel, St. Louis. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

June 14-19, Society of Automotive Engineers: Summer meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

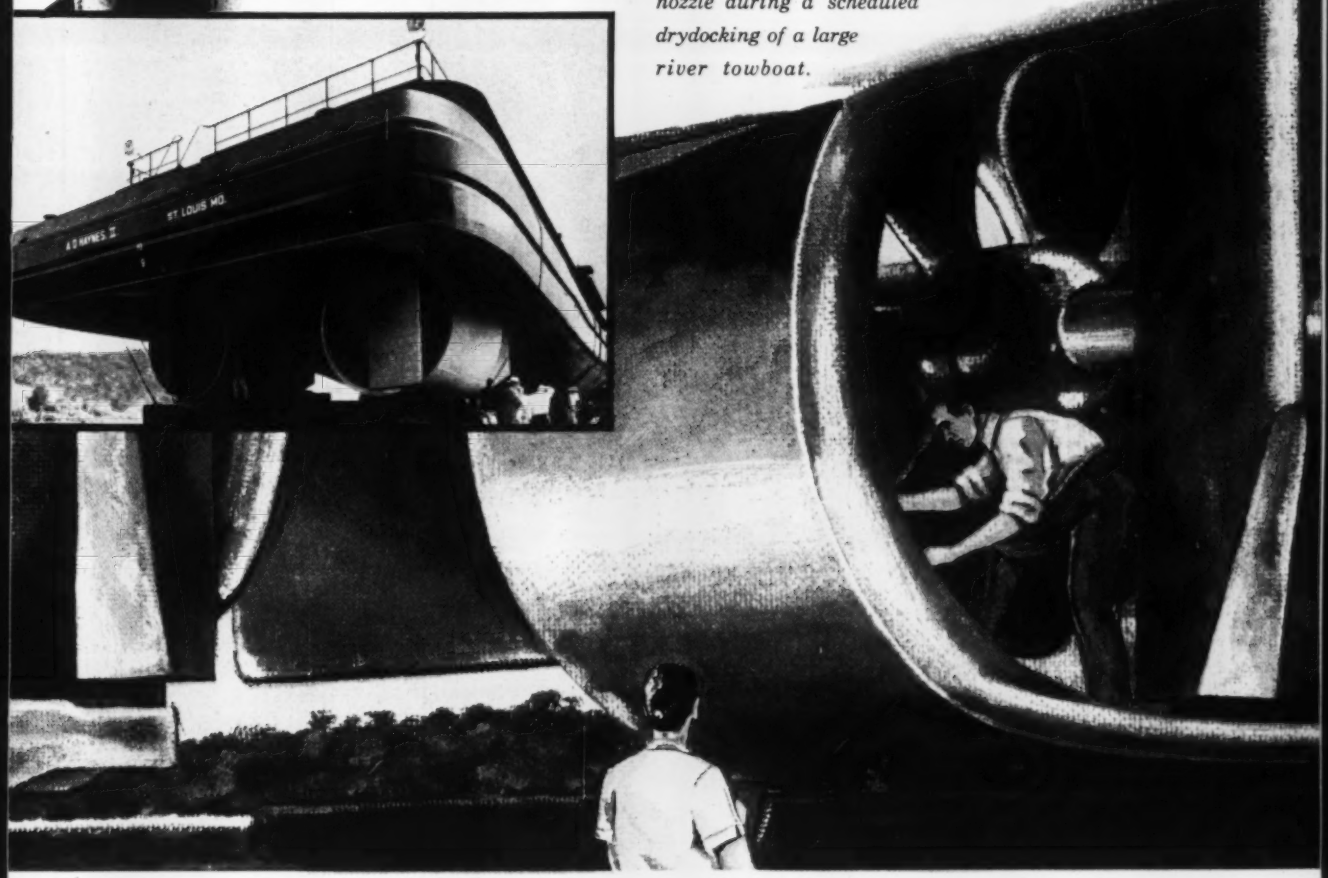
June 15-17, American Nuclear Society: National meeting, Gatlinburg, Tenn. Society's address: 86 E. Randolph St., Chicago 1, Ill. Executive secretary: Octave J. Du Temple.

June 15-18, American Electroplaters Society: Annual meeting and industrial finishing exposition, Statler-Hilton and Sheraton-Cadillac Hotels, and Detroit Artillery Armory, Detroit. Society's address: 445 Broad St., Newark 2, N. J. Executive secretary: John P. Nichols.

June 16-19, American Marketing Association: National conference, Statler-Hilton Hotel, Cleveland. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive director: William C. Gordon Jr.

June 21-24, Drop Forging Association: Annual meeting, Essex and Sussex Hotels, Spring Lake, N. J. Association's address: Public Square Bldg., Cleveland 13, Ohio. Executive vice president: Dwight M. Allgood.

...where industrial progress is cast in steel



General Steel service engineers inspect a recently developed cast steel Kort nozzle during a scheduled drydocking of a large river towboat.

FIELD SERVICE...PERSONALIZED PRODUCT ATTENTION

Attention to detail . . . inspection in the plant . . . assistance with assembly . . . inspection again while in use . . . and most important of all, service when you need it . . . these are all parts of General Steel's complete service.

When unpredictable events occur, General Steel service engineers are available to you to help return your units to service with minimum delay.

Representatives from every department . . . engineering, manufacturing, sales . . . are available to work closely with you from concept—to casting—to completed product. Let us show you the benefits of this integrated service in helping you plan components of your products . . . in cast steel, cast weld or composite structures.

Write for folder **How General Steel Castings Can Improve Product Design and Performance.** General Steel Castings, Station 230 Granite City, Illinois

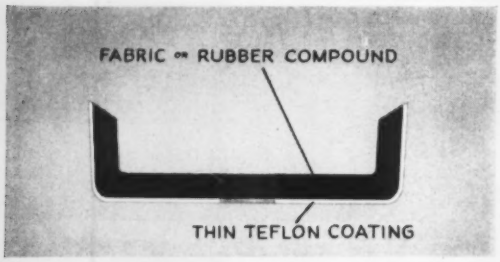
GENERAL STEEL CASTINGS

GRANITE CITY, ILL. • BODYSTONE, PA. • AVONMORE, PA.

NEWEST OF THE GARLOCK 2,000

First Advance in Cup Design in 30 Years

New Garlock TEFLON-Coated Cups



Cutaway shows how TEFLON coating is applied to outer surface of molded cup by special Garlock process. Coating becomes integral part of outer surface.

This exclusive Garlock development will substantially improve the operation of your hydraulic or pneumatic equipment.

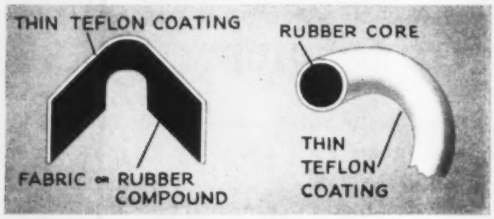
TEFLON-coated cups reduce the breakaway torque required to operate cylinders; reduce running friction; will not stick to cylinder walls even after long periods of idleness. Completely eliminate "squealing." All this, of course, results in longer life, less downtime.

TEFLON, with its low coefficient of friction and anti-sticking characteristics, has for many years resisted the efforts of manufacturers to use it as a coating. The very anti-sticking qualities that make it desirable, also made it difficult to work with. Now Garlock has perfected a technique for coating molded cups with a thin layer of TEFLON. This coating becomes an integral part of the cup.

Most important, of course, TEFLON-coated cups are low in cost, only slightly higher than ordinary cups.

Get full information on this newest member of "the Garlock 2,000" . . . two thousand styles of packings, gaskets, and seals for every need. Call your local Garlock representative or write for Folder 145. You'll find information on other Garlock products in Sweet's Product Design File.

Other New Garlock TEFLON-Coated Products



To reduce friction and reduce downtime at low cost on applications using V-type packings or O-rings Garlock also furnishes TEFLON-coated CHEVRON* packing and TEFLON-coated O-rings. Both have the same exceptional anti-friction qualities of TEFLON-coated cups. These products are available in all the standard sizes. Write for CHEVRON folder AD-115; or O-Ring Folder AD-148.

*Registered Trademark

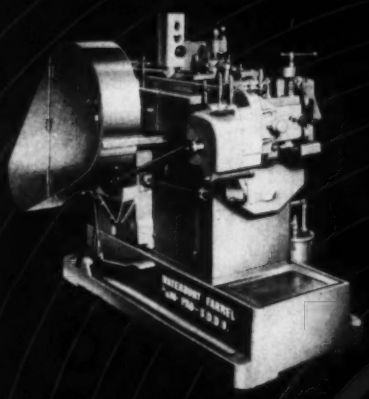
THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

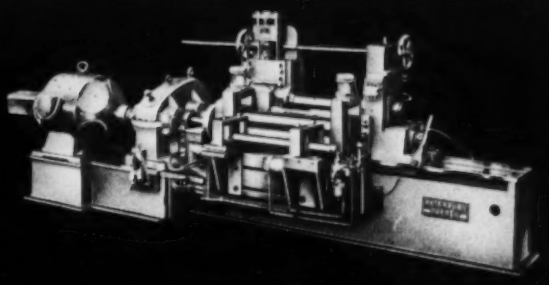
For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U. S. and Canada

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

COLD HEADING
MACHINERY





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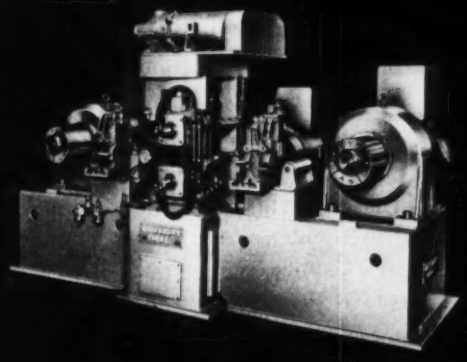

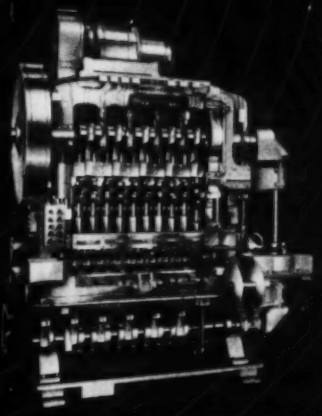

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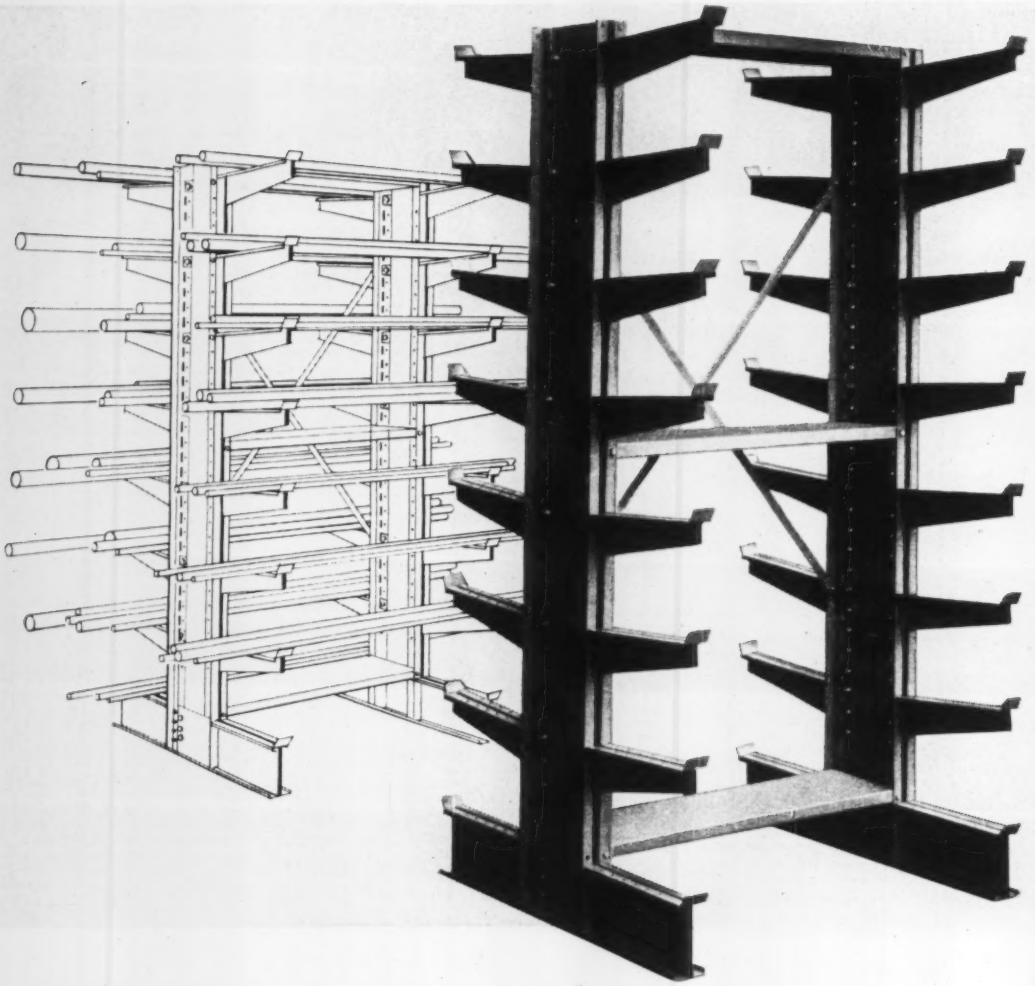

STACK and STORE 14 Tons

IN 36-INCH SPACE...WITH NEW REPUBLIC BAR RACK

This new, all new, double-faced, double duty Republic Steel Bar Rack stacks and stores 14 tons of bar type stock in 36 inches of floor space!

Here is the ideal solution to a practical, economical way to stack and store bars, pipes, rods, any elongated stock. And you can load and unload this new Republic Bar Rack from either side.

Strong and sturdy—made of steel. Engineered and designed for shop convenience. Arm arrangement permits easy access and stock segregation. Arms are adjustable on 2-inch centers. Each arm supports a full ton of bar or pipe type material.

Compact, too. Republic's Bar Rack Double-Face Starting Unit is 78″ high, 36″ wide, and 33″ deep at the base. Each unit consists of two uprights, three divider pans, and two cross braces. Available in either Olive Green or Gray baked-on enamel finish.

Republic's Berger Division is the leading manufacturer of all types of industrial racks and shelving, shop desks and work benches, materials handling equipment, and other specialty shop equipment.

If you have a shop storage or materials handling problem, call your Republic-Berger representative. Republic specialists will help you plan a practical, economical solution. Call, or write direct today.

REPUBLIC STEEL LOCKERS provide clean, attractive, dress-wash-and-change facilities. Big and roomy, interiors are spacious and well designed for convenience and good ventilation. Strong and sturdy, made of steel to assure complete protection of personal effects and tools. Bonderized, an exclusive feature that provides a superior base for the baked enamel finish. Restricts bumps, scratches, abrasions of everyday service to the site of the injury. Available in a wide selection of sizes, styles, and popular locking devices. Write today.

REPUBLIC'S BERGER DIVISION CONTRACT FACILITIES can help you solve fabricating and assembly problems. Berger will manufacture your product in volume runs—engineer, fabricate, finish, pack, and ship, all to your specifications. Your contract-fabricated products can be completely assembled with operating mechanisms installed. Sheet metal assemblies can be finished with a prime coat, ready for final finishing, assembly and packing at your plant. Write today. A Republic representative will review Berger's facilities with you.

STACK...STORE...SHIP...WITH REPUBLIC MATERIALS HANDLING EQUIPMENT. These strong, steel, rugged skid boxes deliver long, efficient service at low per-year cost. They feature corrugated box construction and heavy-duty stacking brackets for easy handling. Four-way space fork channels simplify handling in close-quarter restricted space. Stacking does not damage the boxes and stacking speeds materials handling. Let Republic's Berger Division Materials Handling Specialists solve your materials handling problems. Send coupon.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

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Please send information on the products checked below:

☐ Republic Bar Rack ☐ Republic Steel Lockers
☐ Contract Facilities ☐ Materials Handling Equipment
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Name_____ Title_____
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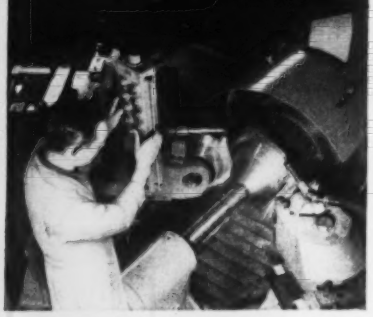
let Ingersoll HYDROSPIN your parts



If the shape of your part is tubular, conical, hemispherical, or curvilinear, hydrospinning by the Ingersoll Kalamazoo Division may save you costly machining expense and time. If you want a seamless part, try hydrospinning. If you want precise wall thickness, turn to hydrospinning. Hydrospinning saves on metal, time and labor.

COMPLETE PRODUCTION FACILITIES

Ingersoll Kalamazoo Division has an experienced engineering staff, and complete hydrospinning equipment. If you have a metal forming problem where hydrospinning may be of help to you, send an outline of your problem or contact the Defense Sales Dept. of

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1810 N. Pitcher St. • Kalamazoo, Michigan

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You are taking advantage of a collection of benefits when you specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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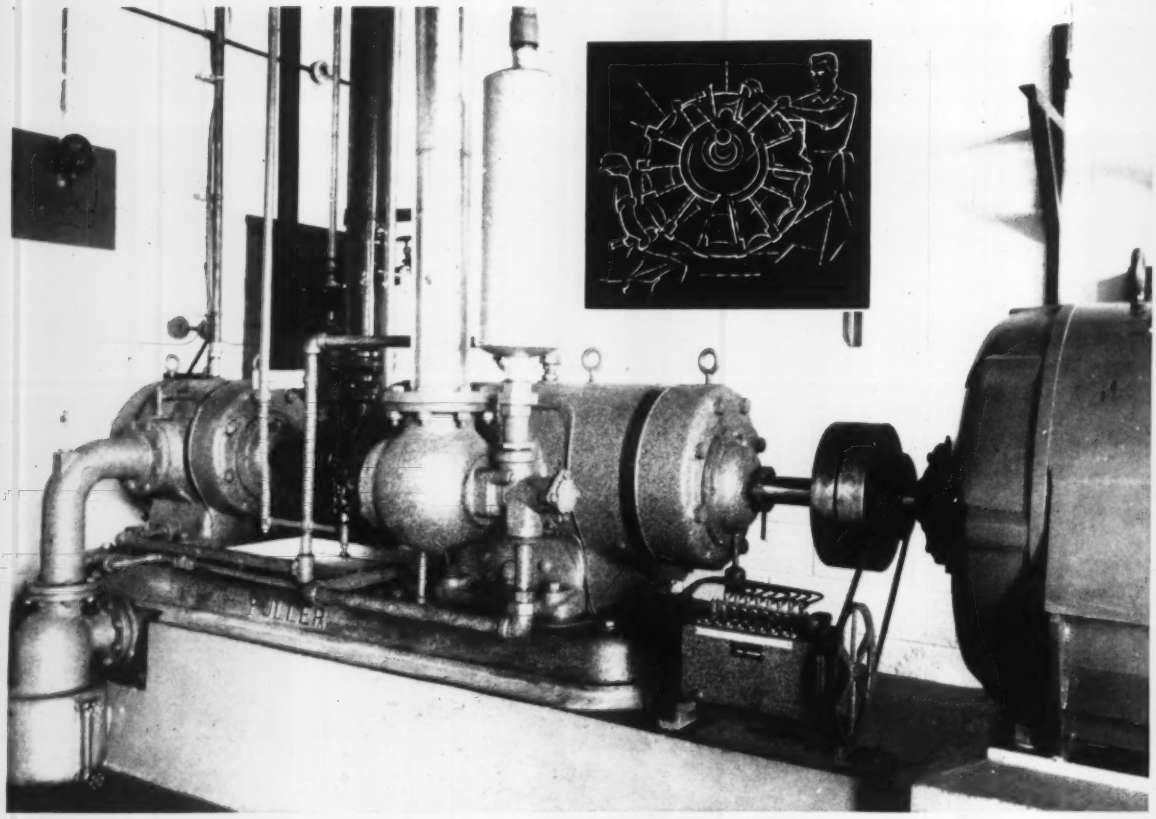

WHY DID AIRWORK SPECIFY A FULLER AIR COMPRESSOR?

Here's what the Vice President-Operations of Airwork Corporation, one of the nation's leading aircraft overhaul companies, writes about Fuller Model C-150-150H Rotary Air Compressors.

"We were running out of air capacity, and had decided that we would like to get rid of the maintenance problems inherent in a piston type air compressor.

"The Fuller compressor with its fewer moving parts and favorable price range met our basic requirements.

"We then checked on Fuller compressor performance through our close contacts with a leading manufacturer of aircraft engines. Their opinion was very favorable. We think Airwork has made the right decision."

Here are the features that sold Airwork on a Fuller Compressor:

- Wide seal between rotor and bottom of cylinder, assuring high volumetric efficiency.
- Rotary design assuring vibration-free flow of air.
- Direct drive.
- Compact space-saving installation.
- Simple foundation.
- No valves to leak or seats to grind.
- Few moving parts, keeping maintenance time to minimum.
- Designed for continuous duty service

When your plant needs reliable air power, call on Fuller. To get all the facts on Fuller Rotary Compressors for capacities up to 3300 C.F.M. and pressure to 125 pounds, write today.

Fuller

FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY

C-323
4914

160 Bridge St., Catasauqua, Pa.

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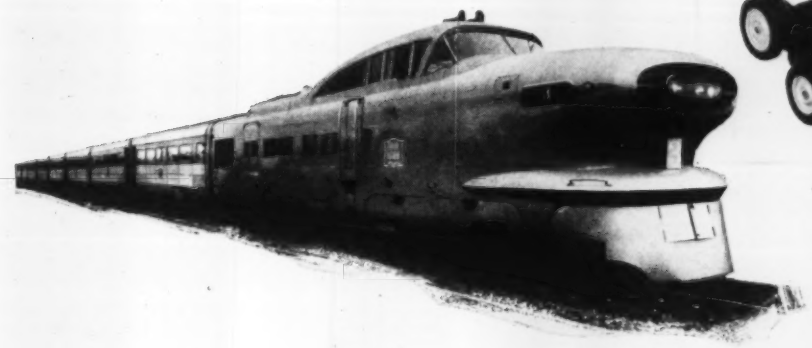
PIONEERS OF HIGH-EFFICIENCY VANE TYPE ROTARY COMPRESSORS SINCE 1930

When you buy aluminum for your product...

Lawn mowers



Trains

Reflective sheeting on aluminum

for custom service check with ANACONDA ALUMINUM

Your product and scheduling requirements become the dictates of every Anaconda Aluminum specialist the minute your order is written. Their follow-through is what we call custom service.

Because of the extreme flexibility designed into all Anaconda Aluminum's modern production facilities, your order—large or small—is scheduled promptly, shipped on time. Every order receives the personalized attention of experienced aluminum craftsmen throughout production—added assurance that precision controls maintain your critical specifications.

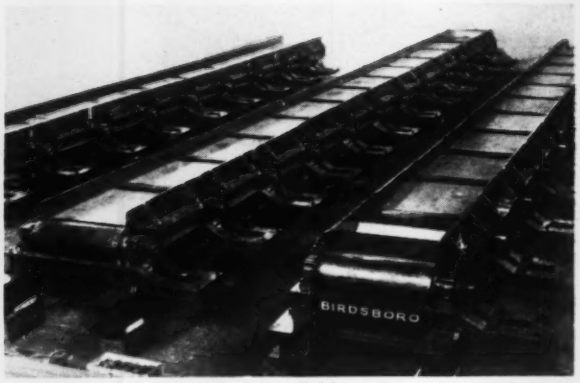
In addition to the satisfaction of such custom-shop service, Anaconda Aluminum gives you all the advantages of integrated production with a full range of products—pig and ingot, coiled and flat sheet, rod, bar, structurals, tubular and other extruded shapes. For custom service on your next order, call your Anaconda Aluminum representative, or write our General Offices, Dept. S-4, Lousiville 1, Kentucky.

Every industry has one member who specializes in customer satisfaction

ANACONDA ALUMINUM

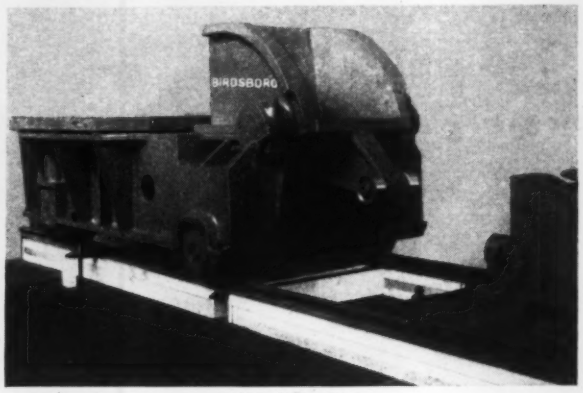
ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE, KENTUCKY

36" 2 High Reversing Blooming Mill



Transfer Tables

Front and Back Mill Tables and Manipulators



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For a complete mill . . . or a customized unit

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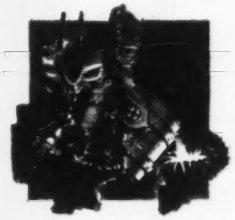

AMERICAN ORIGINALS IN IRON AND STEEL

The process that was born by accident

Pondering the possibilities of cold rolling one day back in 1860, Bernard Lauth* was observing a millworker snake hot iron bars between swift-turning rolls. Suddenly the worker's tongs were yanked from his hands and pulled through the rumbling mill.

Later on, as the story goes, Lauth recovered the flattened implement and was fascinated by the high luster given to the metal. In later experiments, he discovered that by cold rolling iron bars he achieved greatly improved accuracy, appearance and physical characteristics, including strength.

Thus, it was partly by accident that the cold-rolled process was born . . . the process that today is being so successfully applied to modern steels.

Baker's MAGDOLITE, likewise, was an important early discovery in the annals of iron and steel. And, year by year, continued research has improved this product. Today MAGDOLITE helps you to obtain more ingots and better furnace efficiency at lower refractory cost. Users tell us that Baker's MAGDOLITE is 5 ways better . . . in composition, preparation, strength, economy, and quality.

Don't say dolomite. Save dollars. Specify Baker's MAGDOLITE!

*Bernard Lauth was a partner of B. F. Jones, Sr., founder of Jones & Laughlin Steel Corporation.

ANOTHER AMERICAN ORIGINAL

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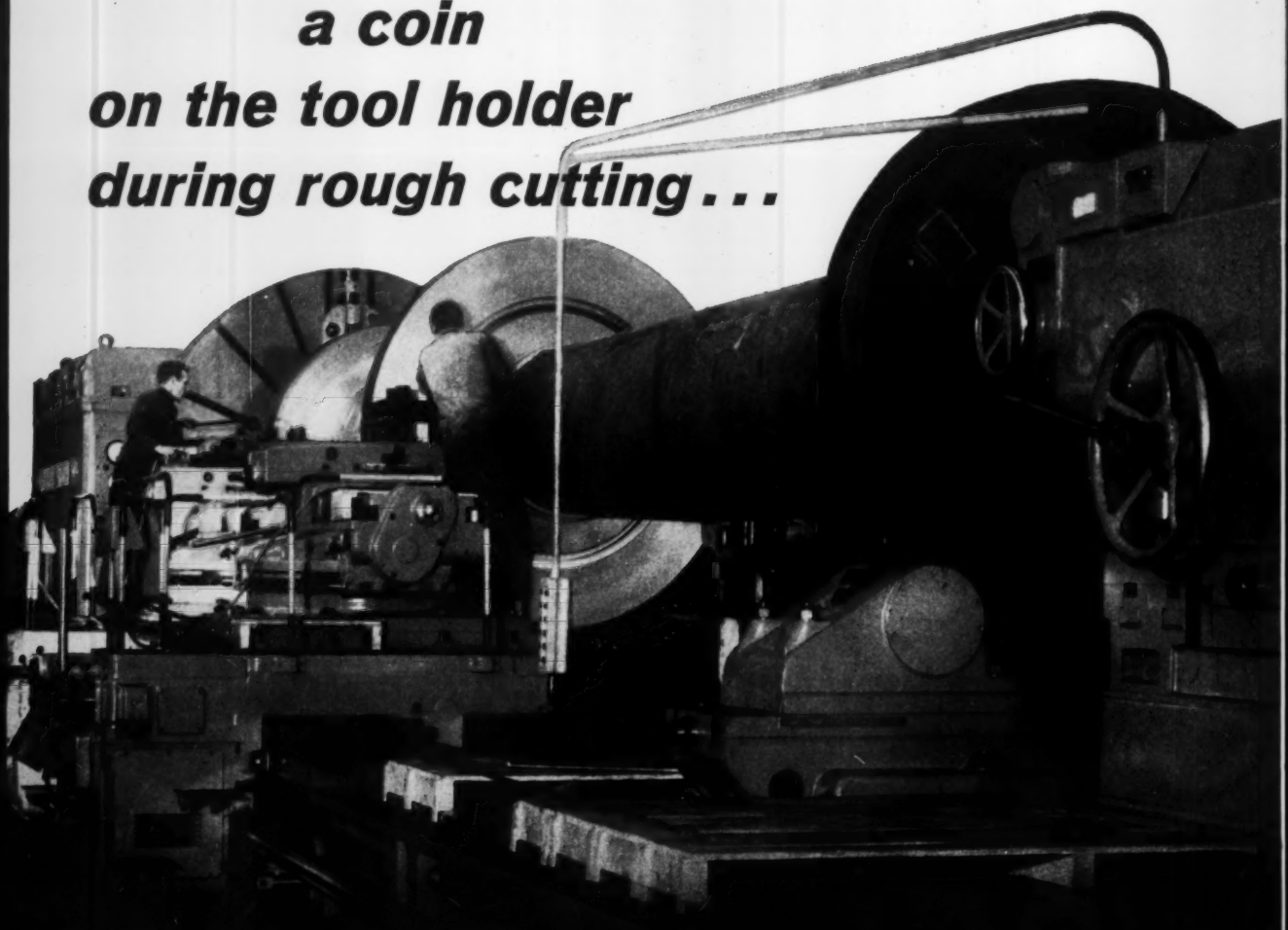
PRODUCTS
SINCE 1889

BAKER'S MAGDOLITE
The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO

you can balance a coin on the tool holder during rough cutting . . .



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waldrich high speed lathe

Series WSD

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- Maximum utilization of horsepower in main drive
- Rugged headstock
- Heavy duty tail stock
- 3-way and 4-way bed design
- Fast, efficient chip collecting

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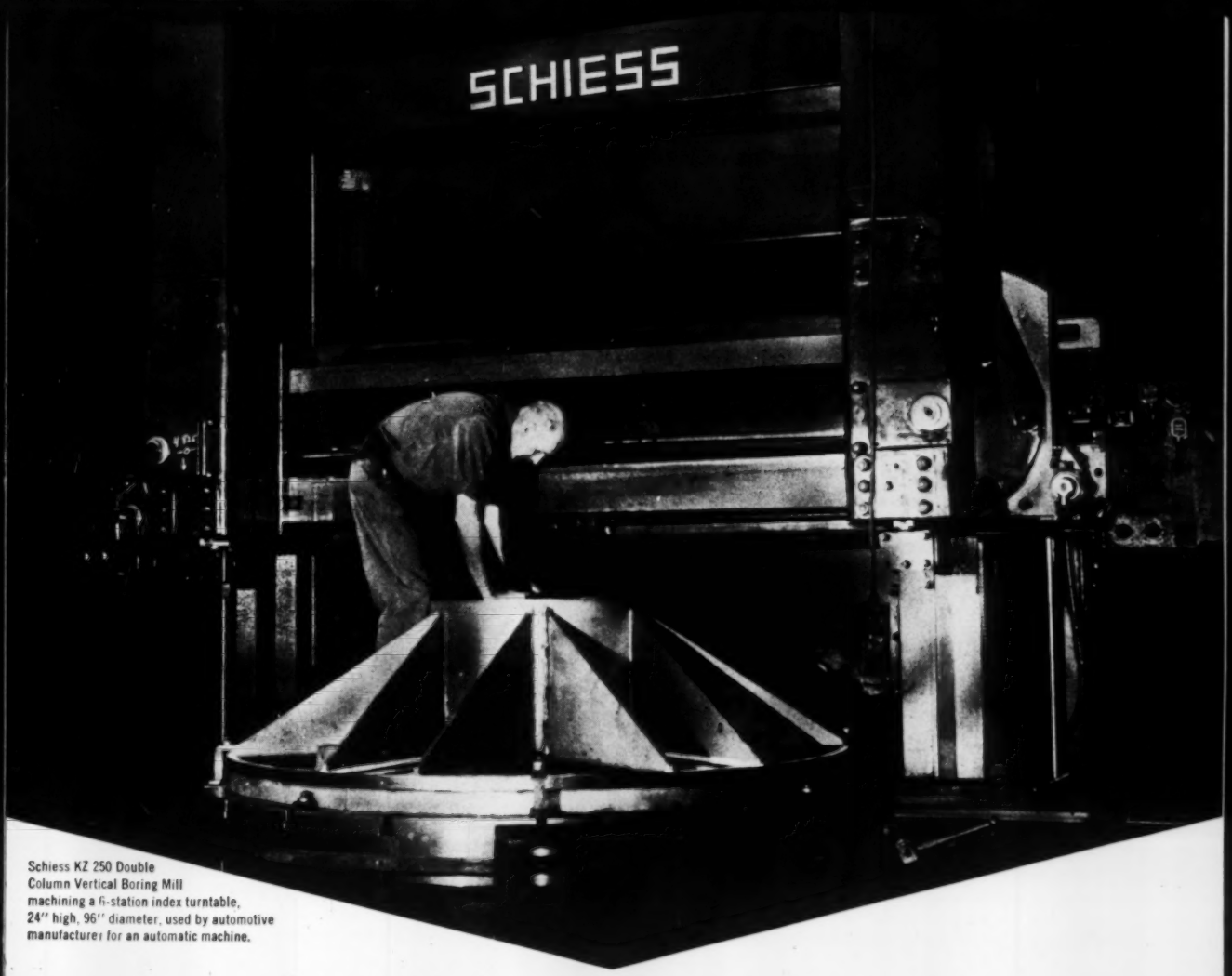


Schiess KZ 250 Double Column Vertical Boring Mill machining a 6-station index turntable, 24" high, 96" diameter, used by automotive manufacturer for an automatic machine.

"Our Schiess vertical boring mill DOES THE JOB 3 TIMES FASTER, MORE ACCURATELY, with a BETTER FINISH!"

Hahn Manufacturing Company, 5332 Hamilton Ave., Cleveland

Jobs of increased size and time limitations no longer hold back production at Hahn Manufacturing Company.

The company reports: "Our Schiess machine has already handled a 60" high cast iron cylinder and a 108" diameter ship propeller. We cut production time by using the two boring heads together. For instance, one head can be used for roughing while the other is finishing. Or one head can be used for turning while the other is boring.

"Our operators claim the machine is just about foolproof. They like the cross-rail electro mechanical controls. They also praise the hydraulic pre-selection of speeds, the finger-tip control for direction of feed and rapid traverse, and the all-vertical gear drive. Another thing—no special training was needed. Our regular machinists put it right to work as soon as they learned the controls.

"The Schiess mill does our big jobs just about three times faster, provides a better finish, is more accurate and results in less spoilage."

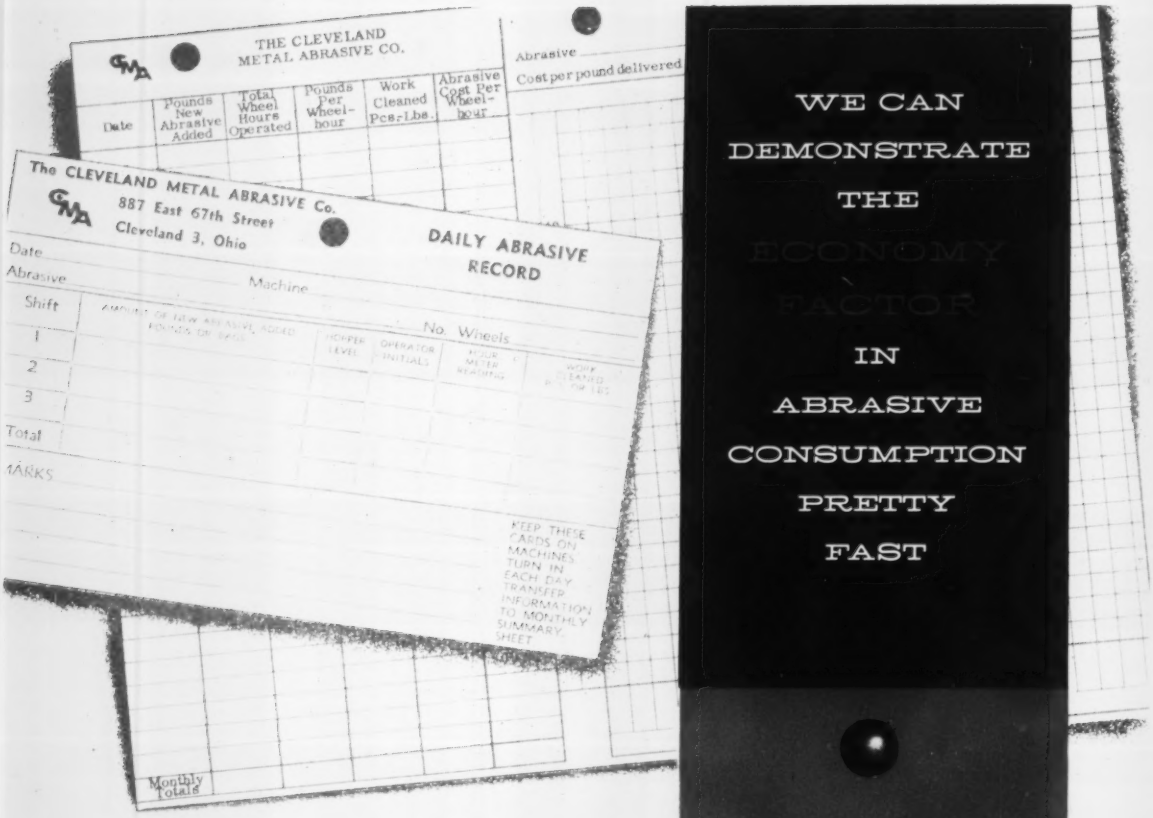
Get to know this product of Europe's largest builder of heavy machine tools. Parts and service are as close as Pittsburgh. An American Schiess engineer will be happy to help you size up this heavy producer for your heavy production needs.

Write for catalog and complete specifications.

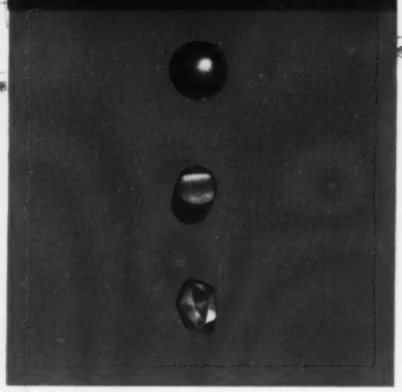
Standard Model KZ Double Column Vertical boring mills are available with 80", 98" and 118" turning diameters.

SCHIESS

AMERICAN SCHIESS CORPORATION • 1232 Penn Avenue, Pittsburgh 22, Pa.



WE CAN DEMONSTRATE THE ECONOMY FACTOR IN ABRASIVE CONSUMPTION PRETTY FAST



Simple arithmetic and common sense establish the pattern. It's simply a matter of making high quality, *long-lasting* abrasives. The less you use, the more money you save. Take Cleveland High-strength "A" iron shot and grit. Greater abrasive life and decreased machine maintenance costs offset any minor increase in initial costs. Bargain prices cut no ice . . . ever.

Prove to yourself the savings you get from this, and other, Cleveland Metal Abrasives. Write—and ask for our new abrasive cost system, which our engineers can quickly establish for each machine, at no cost to you.

Also write us today for more information, together with new catalog No. 159, or call our nearest representative.

CLEVELAND is the name and the place for PERSUASIVE ABRASIVES

1. Realsteel Shot and Grit	2. Pearlitic Malleable	3. Normalized
4. "A" Iron	5. Hi-Strength "B"	6. Chilled Iron
		7. Cut Wire

the CLEVELAND metal abrasive company

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It tells the story of an all-purpose steel bar that replaces maintenance steels, such as C-1018, B-1112, A-4140, and most of the more than 125 different types on the market.

La Salle all-purpose **STRESSPROOF®** STEEL BARS

You don't have to heat treat. It's strong. It machines faster. It wears better. Simply select the right size bar, machine your part and install it. Why carry a large stock of different maintenance steels when it isn't necessary? One stock of all-purpose STRESSPROOF takes care of most of your needs.

You can make parts like these . . . easier and faster

arbors
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beveled gears
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bushings
cross feed screws
cylinders
drive gears
fasteners
feed screws
generator shafts
lead screws
magneto shafts
motor shafts
mandrels
pins
piston rods
pump shafts
reducer gears
rotors
set screws
sleeve shafts
speed gears
spindles
spline shafts
steering rods
studs
take-off shafts
tool holders
tie rods
valve stems
wrist pins
worm shafts

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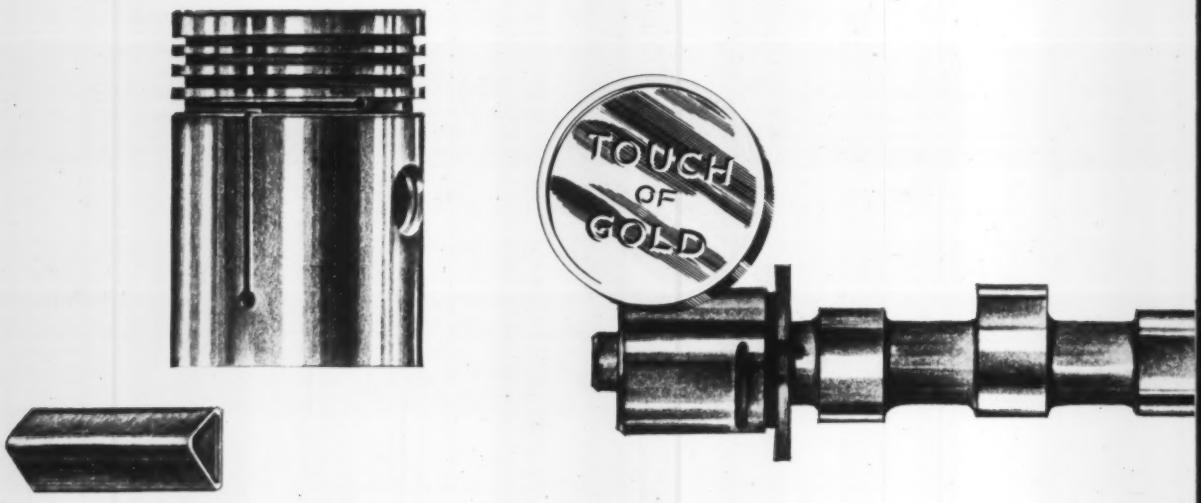
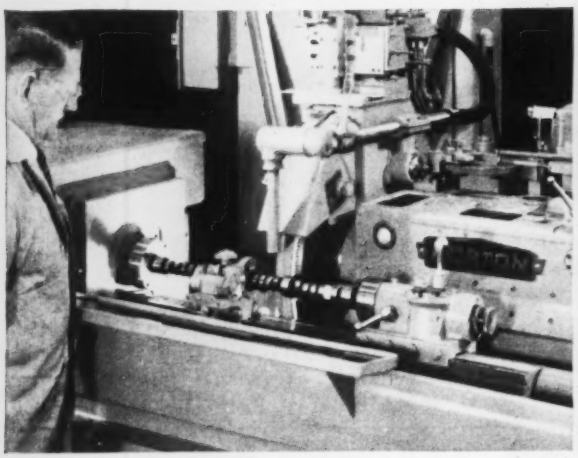
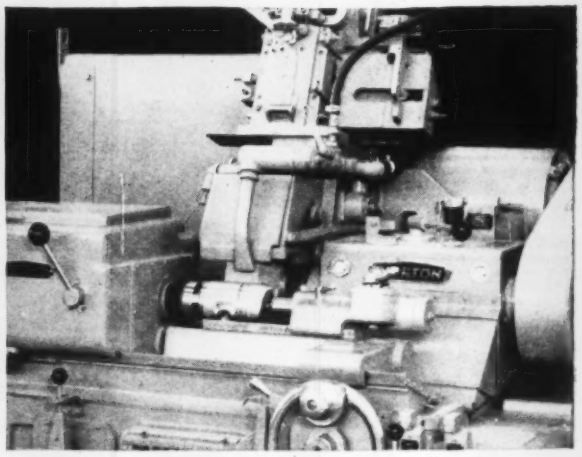


If you grind
special shapes . . . like these

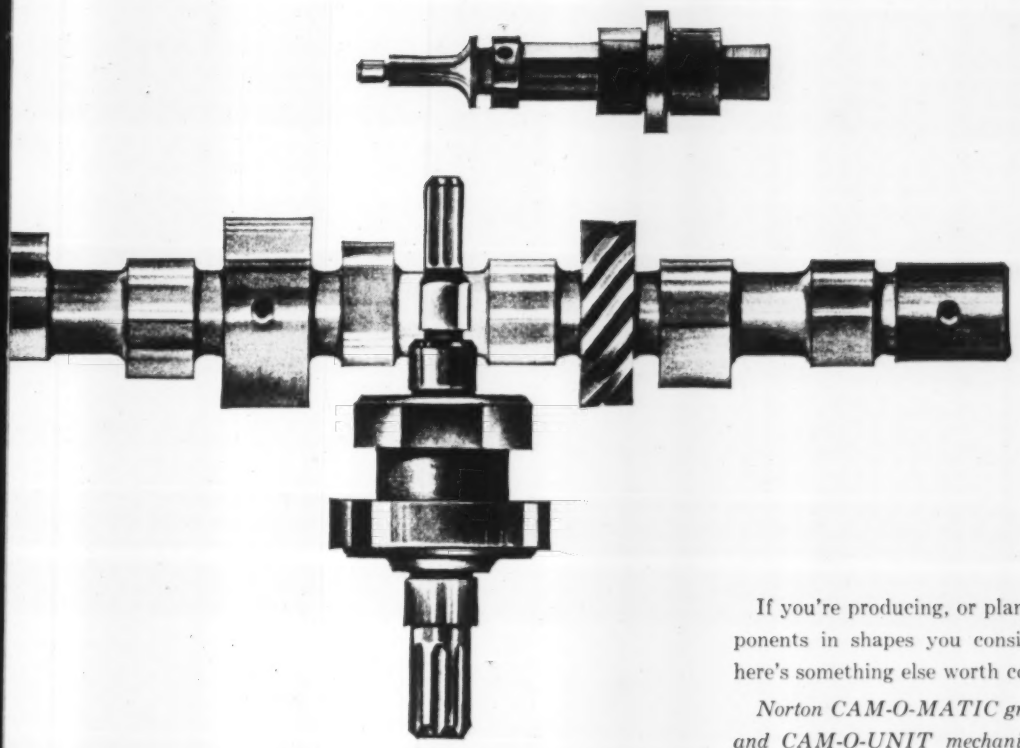
Check the special advantages of Norton grinders . . .



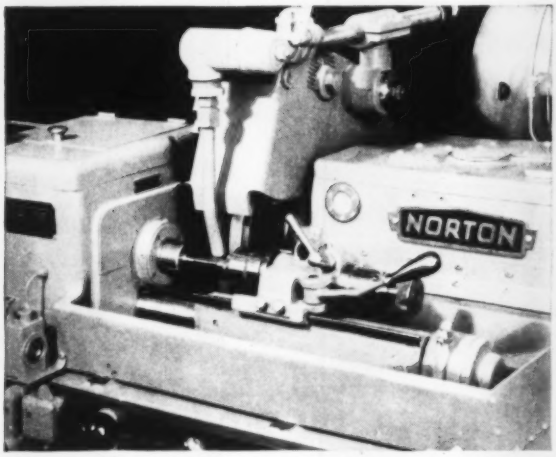
With a Norton No. 3 CAM-O-MATIC® Grinder, you grind all cams and the eccentric on an automotive-type camshaft automatically, in one handling. Automatic wheel truing and a patented device for grinding cam tapers in one or both directions are among the features that improve contour, finish and production rate.



A Norton 6" x 8" Semiautomatic Piston Grinder adds extra speed and economy to your grinding of elliptical pistons. Mechanism arrangements enable you to grind complex ovality into the skirt of a piston, as shown, or to produce standard ovality or different amounts of relief over a wide range.



. . like these



Norton CAM-O-UNIT* Mechanisms, made in varying work capacities, are particularly valuable for extending the proved advantages of Norton CTU cylindrical grinders to the grinding of cams, elliptical pistons and many other forms. The CAM-O-UNIT mechanism shown is attached to a 6" CTU to grind the three faces of a carbide tool bit.

If you're producing, or planning to produce, components in shapes you consider difficult to grind, here's something else worth considering.

Norton CAM-O-MATIC grinders, piston grinders and CAM-O-UNIT mechanisms are engineered to handle a wide range of cam and shape grinding . . . including endless variations of square, triangular, oval and many-sided forms . . . and to provide the exact forms and tolerances you need with fast, trouble-free performance that will lower your operating costs.

Shapes you can produce on this special grinding equipment include not only arcs but curves and tangent flats in combination. Your Norton Man, a trained grinding engineer, will be glad to give you expert help in selecting and operating grinding equipment that will bring you top-quality, low-cost results on the toughest jobs. NORTON Company, Machine Division, Worcester 6, Mass. District Offices: Worcester, Hartford, Cleveland, Chicago, Detroit. *In Canada:* J. H. Ryder Machinery Co., Limited, Toronto 5.

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Making better products
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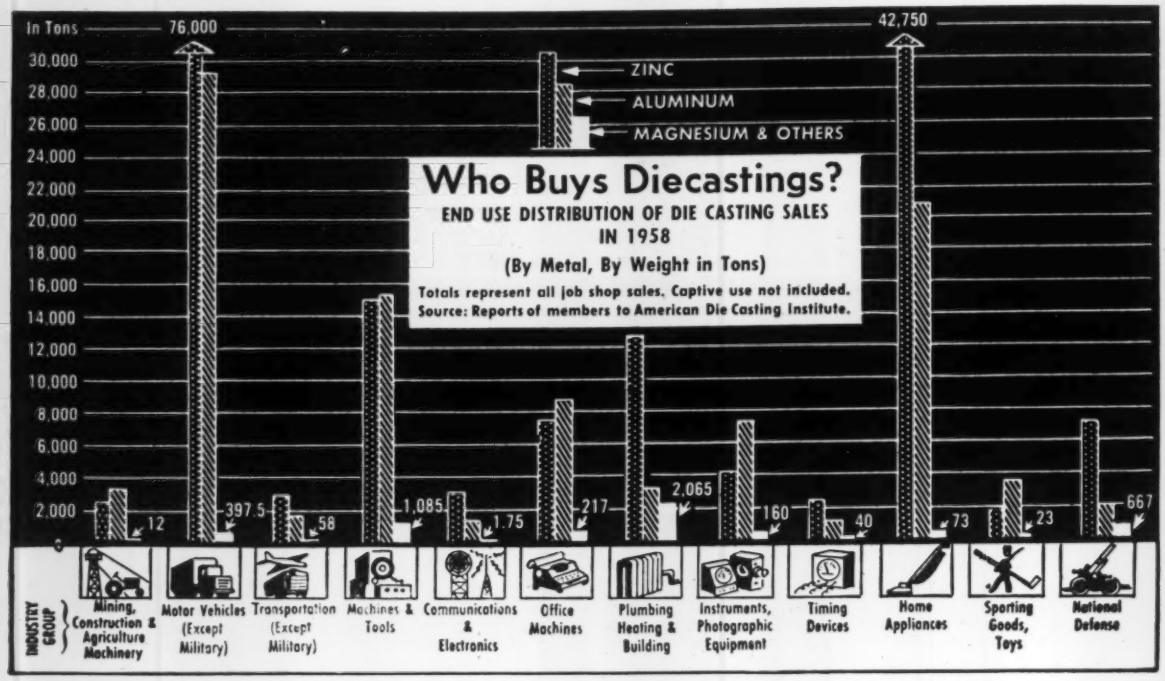
NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electro-Chemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes



these industries do!

Applications of zinc base die castings are steadily becoming more varied and more widespread. Today, it would be virtually impossible for anyone to go through an ordinary day's routine of living without using—directly or indirectly—an immense number of appliances, devices and services in which zinc alloy die castings form essential parts. The chart above shows sales by job shop die casters in 1958. The superior physical characteristics of zinc as a base metal for die castings is indicated by the fact that in 1958 67% of all die castings by weight, sold by job shops, were based on zinc.

Die Casting . . . the shortest distance between raw material and finished product . . . is the second largest consumer of zinc and is continuing to expand because of industry's recognition of what the process has proved itself to be: One of the fastest and most economical production techniques at the command of the metalworking industry today.

DIECASTING is the Process.. ZINC, the Metal

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The right start calls for modern facilities such as provided in our new office and engineering building. But more important than facilities are the abilities of the progressive engineers here to serve you.

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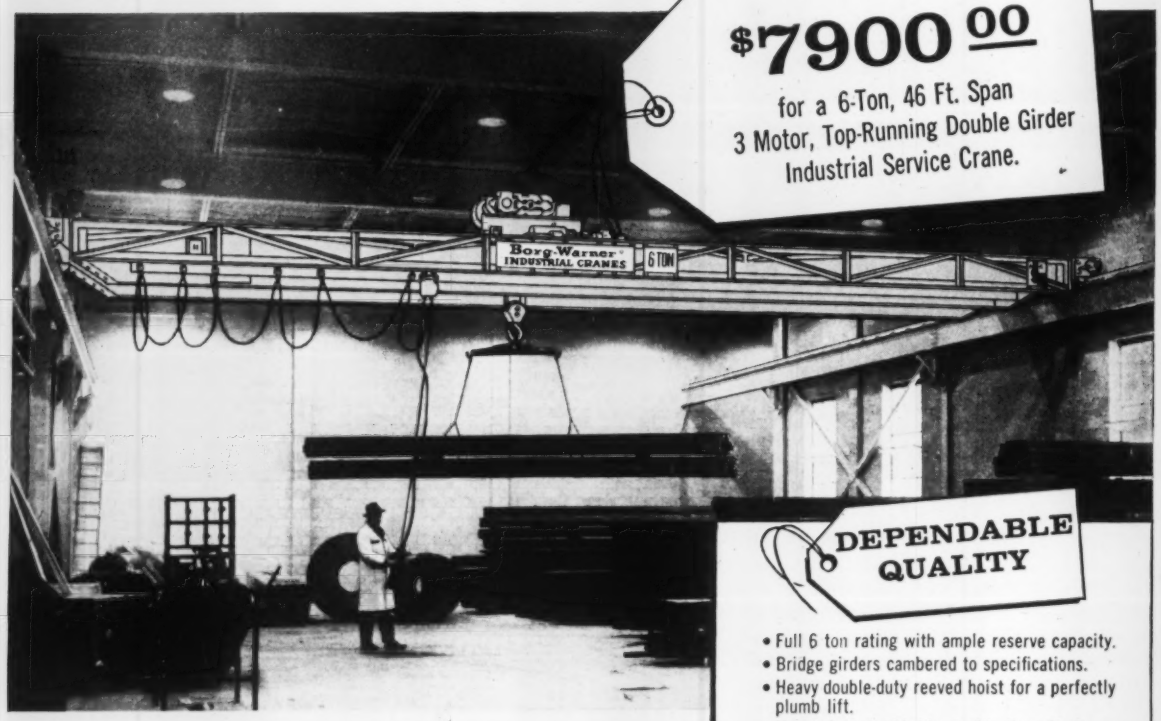
Completely integrated lines: Pickling lines, Scrubber lines, Slitting lines, Shearing lines, Extrusion presses and all auxiliary equipment, Furnace charging equipment, Runout tables . . . Paralloy and ductile iron rolls . . . Custom built equipment . . . all benefiting from our ¾ century of experience. Tell us your needs.

The Youngstown Foundry & Machine Co. Youngstown, Ohio

Serving Industry Since 1885

Now you can afford Borg-Warner Quality in your next overhead Crane...



$7900.00
for a 6-Ton, 46 Ft. Span
3 Motor, Top-Running Double Girder
Industrial Service Crane.

Advanced engineering and standardization make...

Borg-Warner Industrial Cranes

BETTER VALUES at LESS COST

Borg-Warner crane engineers and production men have taken a new look at the entire line and come up with important economies through extensive use of standardized interchangeable components. Because these savings are passed along to you, you get more crane for your money when you specify Borg-Warner Industrial!

Efficient overhead materials handling pays off. You get more overhead storage space than fork truck handling provides. You benefit from aisles and work areas uncluttered by floor-type handling equipment. You can reach all areas under the crane, the full length of the runway.

If you are planning a new factory building, an addition to present facilities or a modernization program, it will pay you to look to Borg-Warner Industrial Cranes for the best values in overhead materials handling equipment.

DEPENDABLE QUALITY

- Full 6 ton rating with ample reserve capacity.
- Bridge girders cambered to specifications.
- Heavy double-duty reeved hoist for a perfectly plumb lift.
- Heavy duty steel bridge and trolley wheels.
- All welded jig bored, jig assembled end trucks.
- Long life precision ball and roller bearings throughout.
- Precision assembly of girders and end trucks with fitted bolts in reamed holes.
- Outrigger machinery girder construction.
- Magnetic bridge brake.
- Heavy duty gear reduction bridge drive.
- Fluid coupled bridge and trolley drives.
- Full magnetic push-button floor control.

ADVANCED DESIGN

The crane illustrated is a typical double girder installation. Span may be shorter or longer with greater or smaller capacity and for lighter or heavier duty, intermittent or continuous. Whatever your overhead handling requirements Borg-Warner Industrial Cranes can supply your needs with quality equipment at a price you can afford!

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Sonic testing, employing high-frequency sound waves, is one of several methods for detecting internal flaws in steel. Above, an open die-forged shaft is being sonic tested prior to shipment for use in a gyratory crusher.

Quality control—a vital activity at Standard Steel Works

Every conceivable shop and laboratory test required for modern quality control can be performed by Standard's staff of metallurgical technicians. Testing of incoming raw materials for undesirable elements, testing of finished product for minute quantities of gas, ultrasonic, X-ray and microscopic examination, and tests for dimensional integrity are but a few of the routine checks which assure that the finished, delivered product will meet the most rigid specifications. Write Department 2-F for full details.

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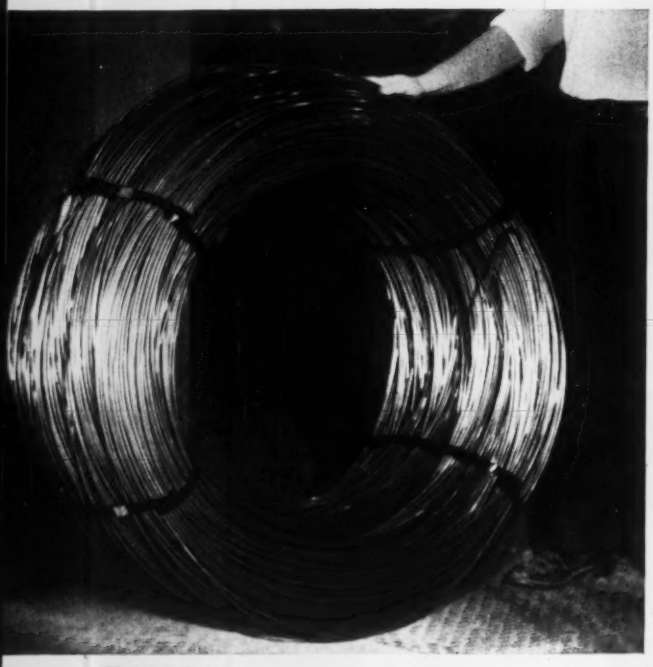
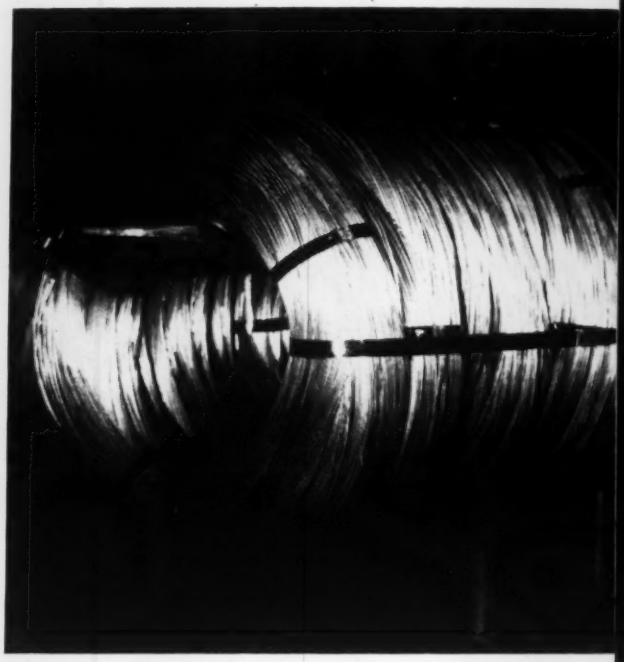




SAVE! HEAVYWEIGHT COILS

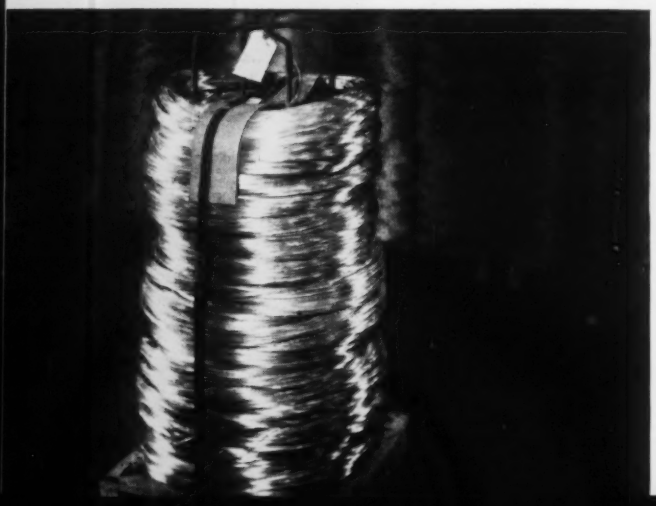
save down time, handling time and storage space!

These continuous wire coils, weighing up to 2,000 pounds, speed up mill production by reducing down time for reel changes; save on handling and storage since one large coil takes the place of several smaller ones of same total weight. Heavyweight coils carry no price extra!

SAVE! UNITIZED COILS

cut down handling operations, make more efficient storage!

Where your machines cannot accommodate extra long-run coils, these unit packs offer great saving in handling time and storage space. One unit, containing several smaller coils, is easily handled; takes up less storage space than the same coils stored separately.



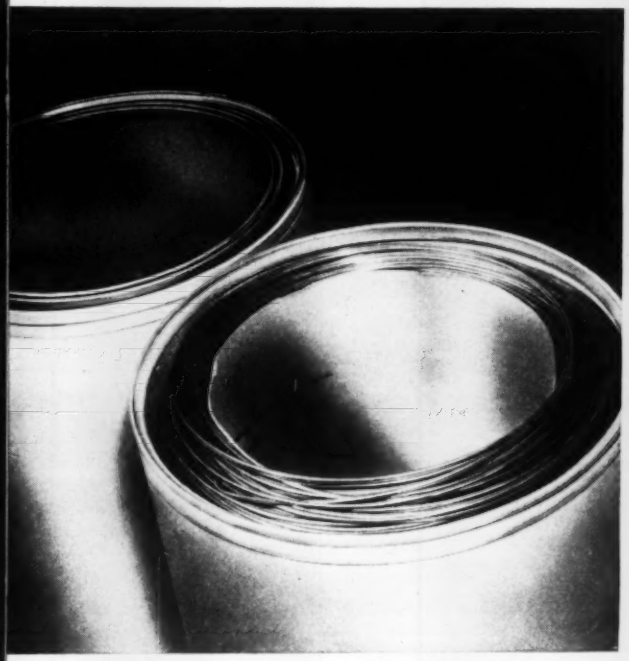
SAVE! PLATFORM COIL CARRIER

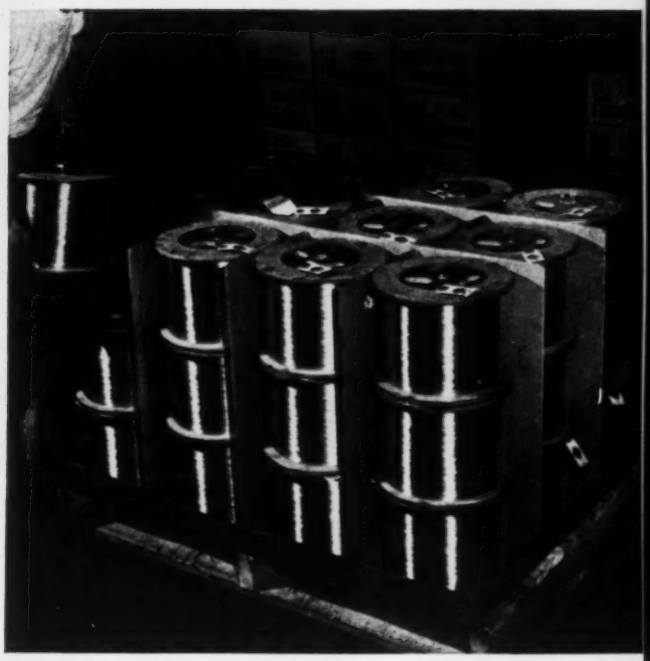
—ideal for ordering, handling large quantities of wire!

The disposable platform coil carrier, made up of U-shaped wire fastened to a platform, can hold up to 3,000 pounds of special wires in one continuous length.

USS American

AND SPACE Wire Packages!





SAVE! PAY-OFF DRUMS

speed up handling, storage—protect wire finish!

Long-run continuous coils of wire are packed and delivered in heavy fibre containers. These Pay-Off Drums are easy to handle and stack for storage; ideal for use where wire finish requires special protection from dirt and mill atmospheres. Size of wire, length and weight of coil to your specifications. No return on containers.

SAVE! DISPOSABLE SPOOLS

are easy to handle and stack, take up little space!

These new non-returnable spools can be supplied with any amount of fine wire from 5 pounds to 65 pounds. They are easy to handle individually, and when shipped in quantity are delivered 36 to a pallet, ready to store as is.

Another American Steel & Wire "Customer Service" Feature

These new American Steel & Wire Packages are designed to help you save storage space, to reduce your handling time to a minimum and to speed up your production lines. For more information on these packages and the ways to use them to plan for better warehousing, get in touch with American Steel & Wire. General Offices: 614 Superior Avenue, N. W., Cleveland 13, Ohio.

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Manufacturers Wire

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Lincoln

WELDYNAMICS

NEWS ABOUT ARC WELDING AT WORK CUTTING COSTS

Oil well pump chain housing is positioned for flat welding with Jetweld. Welding speed is doubled.

OIL FIELD PUMPING UNITS NOW WELDED TWICE AS FAST

Doubling welding shop production without increasing their investment in labor or machines was accomplished by the Parkersburg Rig and Reel Company at Coffeyville, Kansas.

This firm manufactures oil field pumping units. The complete structure of these units is welded and varies in size depending upon the requirements of the well on which they are to work. Bases are fabricated from as small as 8" 17 lb. beams to as large as 14" 68 lb. beams. One exceptionally large unit used a 36" 210 lb. member for the walking beam.

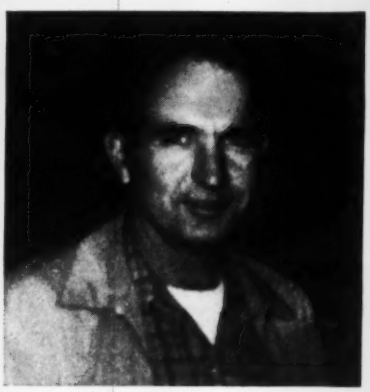
Under the supervision of Jess Kern, Plant Manager and Sammy Doss, Welding Foreman, tests were conducted in the Parkersburg shop in an effort to increase welding efficiency.

A Lincoln welding engineer, Robert Clipsham, surveyed the welding operation. He studied the procedures used and conducted tests with various electrodes and equipment.

The survey indicated that with minor positioning changes almost every weld could be made with a faster, easier-operating iron-powder electrode.

Parkersburg is now using Jetweld 1 electrodes almost exclusively. Mr. Doss says, "Jetweld is twice as fast as the conventional electrodes we were using. It gives us better looking welds, mileage per rod is greater, and weld cleaning is much easier and faster."

Completed chain housing mounted on base fabricated from I beams.



Sammy Doss, Welding Foreman at Parkersburg Rig and Reel has switched to Jetweld almost exclusively.

For help with welding procedures and cost reduction ideas call your Lincoln welding engineer today.

NEW WELDER TAILORED TO YOUR NEEDS

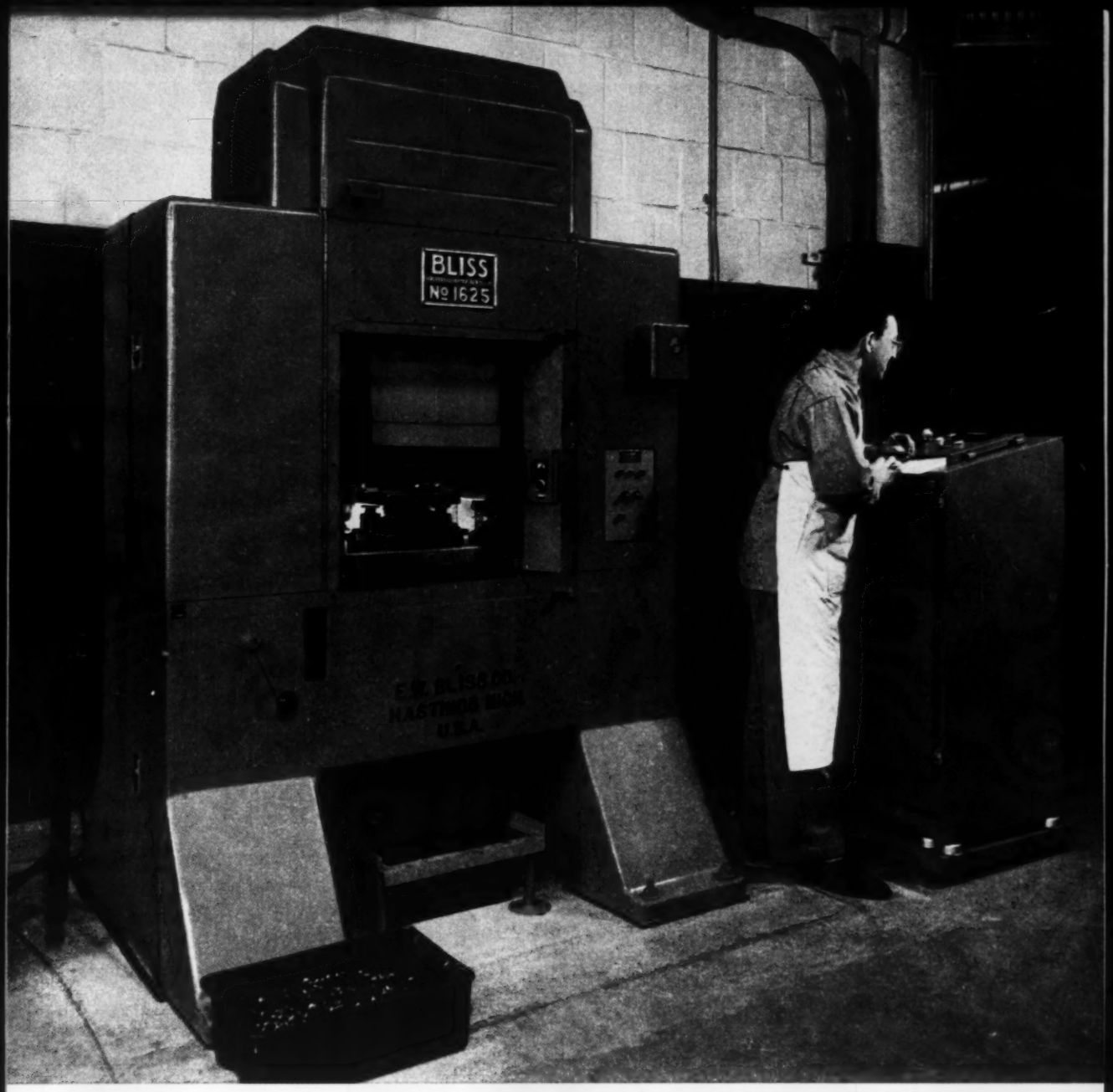
The new Lincoln Idealarc "TM" welder has been designed to meet the needs of any shop.

The key to the "TM" model's versatility is a wide range of options that expand the uses for the machine.

These new Idealarcs are available in 300, 400, 500 and 650 amp sizes.

Bulletin 4607.1 has all the details. A copy may be obtained by writing The Lincoln Electric Company.

The LINCOLN ELECTRIC CO.
Dept. 1653 · Cleveland 17, Ohio
The World's Largest Manufacturer of Arc Welding Equipment



1000 strokes a minute!

Now in daily operation at the Truarc Retaining Rings Division of Waldes-Kohinoor, Inc., of Long Island City, New York, this new Bliss High Production Press is running at the blurring speed of 1000 strokes a minute, hour after hour, day after day. First of its kind, this completely new press has a revolutionary counterbalancing system and massive, close tolerance construction that virtually eliminate vibration, even at this phenomenal speed. Could a press like this cut your parts cost...add to your profit picture? We'll be glad to give you the facts.

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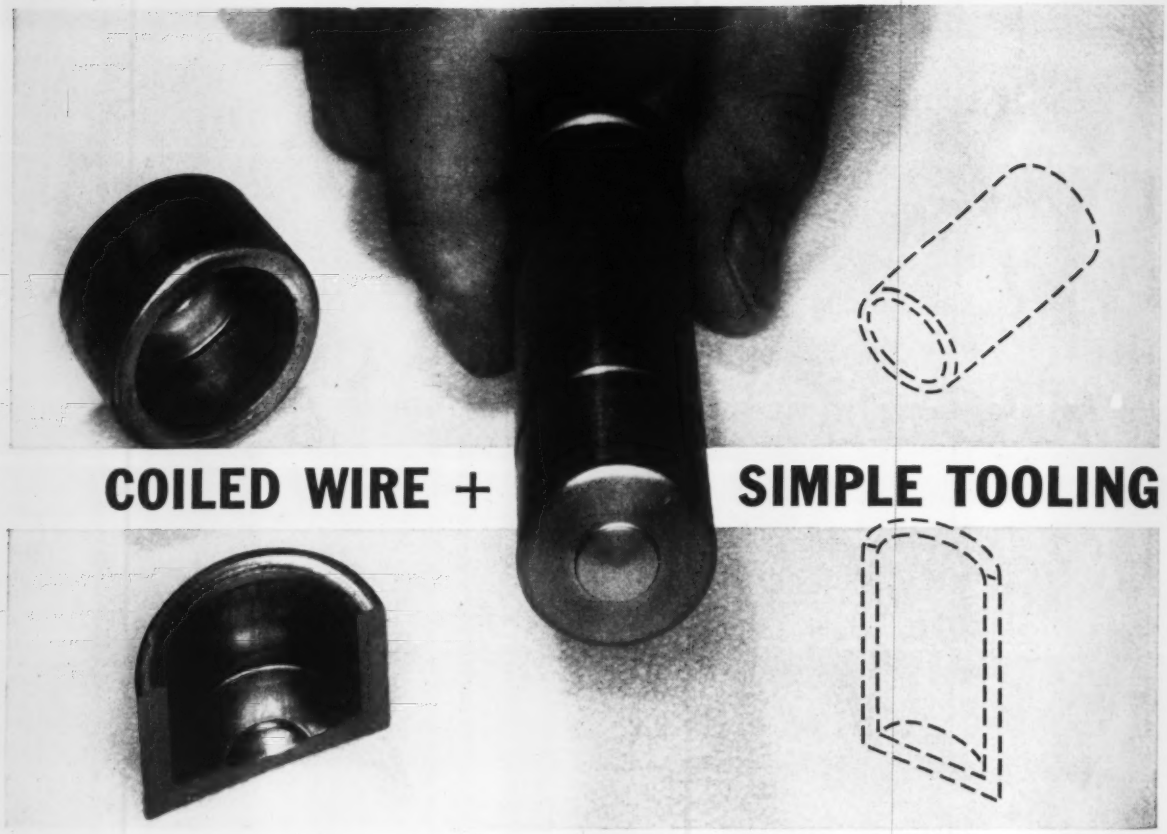
SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CAN MACHINERY • CONTRACT MFG.

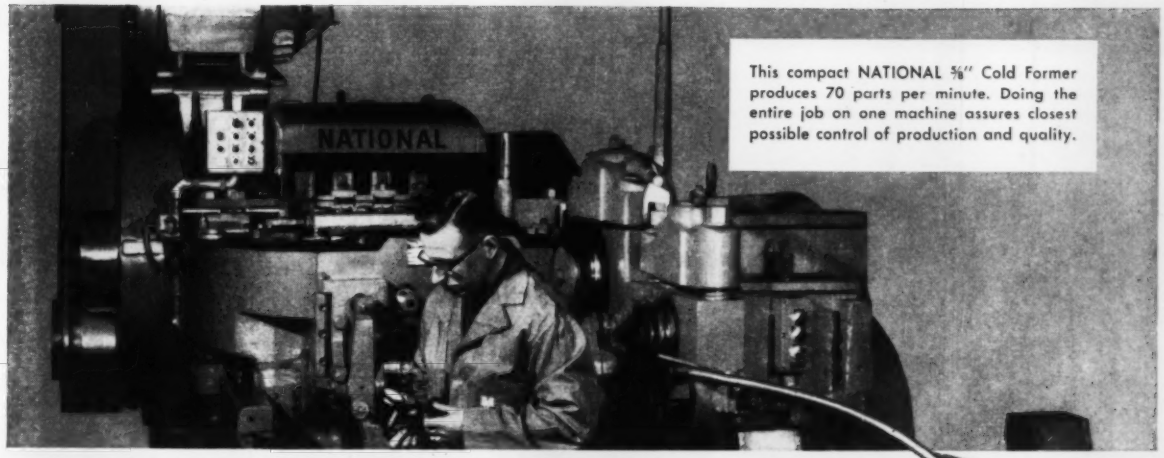


In cold-forming hollow parts from wire, the extrusion punch is the most critical and perishable element of the tooling. And yet, the typical steel punch shown above costs only a few dollars. Punch life for the universal joint bearing cup part is excellent.

Part "X" (name and illustration withheld at customer's request) is a deeper extrusion of higher-carbon material. Punch life for this practically-finished part is also remarkable even though the blanks – cut off from wire right in the Former – *are not end-coated!*

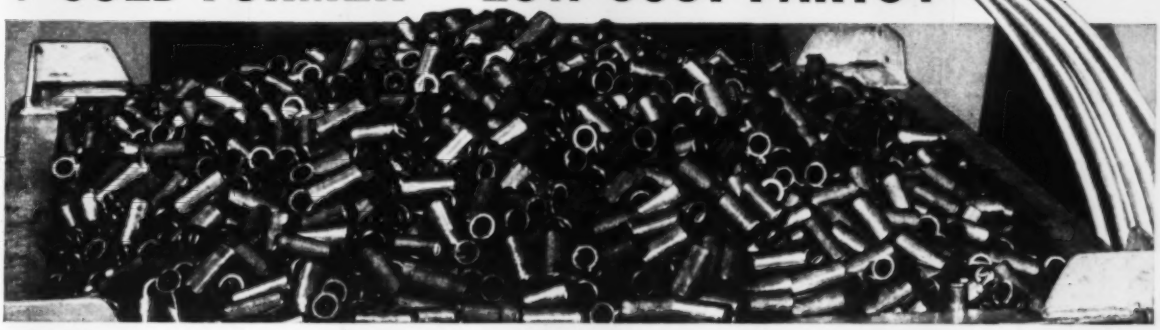
These are two more important cold-extruded jobs which forward-looking U. S. parts makers are now producing – automatically and successfully from coiled wire – on NATIONAL Cold Formers. No slugs to prepare, no in-between heat-treating or annealing, less handling, and many fewer operations.

PART	UNIVERSAL JOINT BEARING CUP	PART "X"
MATERIAL	C-1008 Drawn Coiled Wire	C-1016 Drawn Coiled Wire
MACHINE	3/4" NATIONAL Cold Former	1/2" NATIONAL Cold Former
PARTS PER MINUTE	60	80
EXTRUSION DIE LIFE	Practically Unlimited	Practically Unlimited
IS PART IN PRODUCTION?	Yes, at Pottstown Div. Dana Corp., Pottstown, Pa.	Yes, plant name and location withheld by request



This compact NATIONAL ⅝" Cold Former produces 70 parts per minute. Doing the entire job on one machine assures closest possible control of production and quality.

+ COLD FORMER = LOW COST PARTS!



WHAT IS THE BEST WAY TO DO AUTOMATIC COLD FORMING?

ANSWER: Produce from wire! Cold Formers and Progressive Headers are built upon our conventional Cold Nut Former and Boltmaker designs.

Is Material Expensive?

No. Coiled wire is low-cost material. (Of course, none is wasted by *forming*).

How Long Do Other Tooling Items Last?

Using bearing cup job as an example: Cutter and quill, hundreds of thousands of parts each; carbide die life is measured "by the millions."

What Preparation Does Coiled Wire Need?

None. You buy inexpensive drawn wire, ready to start into the Former.

How Do You Get the Initial Blank?

The Former cuts off accurately, and automatically transfers the blank from station to station until finished.

Do Physical Properties Measure Up?

They are excellent. Cold Forming actually improves them.

What About Labor and Floor Space?

Materially reduced. Verify by comparing Cold Forming with your present methods.

What Are the Biggest Advantages?

With the NATIONAL Cold Former you produce parts complete from coiled wire. You eliminate many operations and related handling problems. Result? More quality parts at lower production cost!

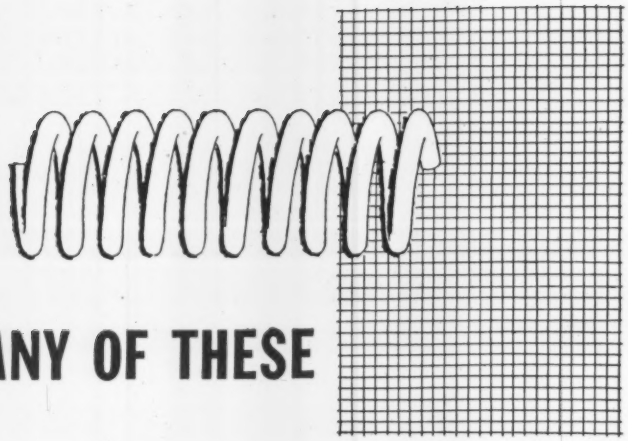
Can Your Jobs Be Made More Profitably by Automatic Cold Forming?
We Welcome You to Tiffin for a Discussion of Your Work

Founded 1874—DESIGNERS and BUILDERS of MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS CO-PIONEERS WITH INDUSTRY OF ADVANCED METALWORKING PRODUCTION METHODS

NATIONAL MACHINERY CO.

TIFFIN, OHIO, U. S. A.

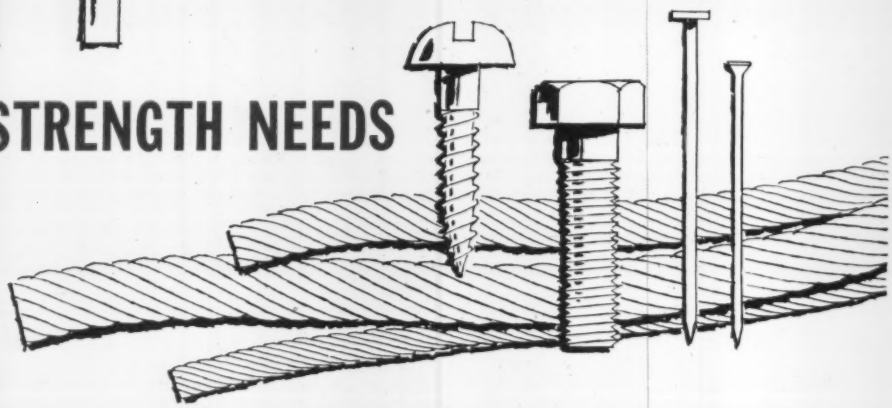
HARTFORD DETROIT CHICAGO



IF YOU MAKE ANY OF THESE

FOR CORROSION RESISTANCE

AND HIGH STRENGTH NEEDS



See what Allegheny Stainless steel wire can do to cut your costs

The assurance of uniform quality, order after order, shows up in lower shop costs in whatever you make from stainless steel wire. A-L specifications are faithful in every batch—in all grades of stainless steel cold-drawn wire, tempered to match many correlations of hardness and tensile strength.

If you make springs, you get uniform tensile strength in every batch of spring wire . . . and also with rope wire.

In weaving wire you get the same dead-soft temper and uniform properties for perfect weaving without ridges.

In cold-headed wire you get absolute uniformity that ties in with automation production processes.

Call on the A-L technical staff for help with selection or fabrication problems, or help in cutting shop costs in processing operations. They will be glad to work with you.

Whatever you make in stainless wire, Allegheny Ludlum offers you adequate stocks of all standard grades for fast shipment. Special stainless steel wire on order.

Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa. Address Dept. S-18.

Write for your copy of Allegheny Stainless Wire, Illustrated 20-page booklet, which fully describes analyses, physical properties, corrosion resistance and principal applications of stainless wire.

WSW 7889

ALLEGHENY LUDLUM

for warehouse delivery of Allegheny Stainless, call RYERSON

Export distribution: AIRCO INTERNATIONAL

EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT

JOB SPECIFICATIONS

Material: SAE 63 naval bronze casting

Thread Specifications:

Diameter	4.640"
Length	4¼"
Type	4 pitch modified square

Equipment: LANDIS 5ALT Tap with 4½" tap head on a No. 5 Gisholt turret lathe

COARSE THREADS *tapped at lower cost*

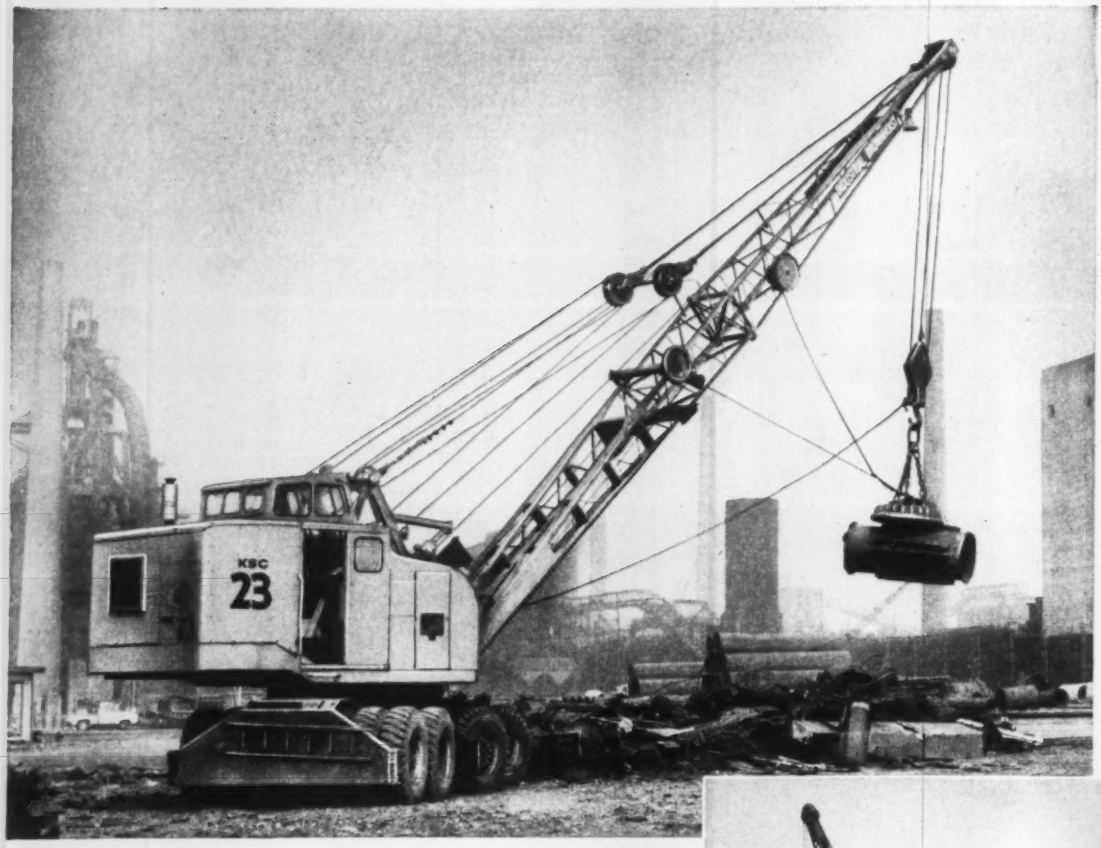
A LANDIS ALT Collapsible Tap produces coarse pitch threads in less than a minute in one pass on a rotating bronze coupling part at the Holys Mfg. Co., Forest Park, Ill.

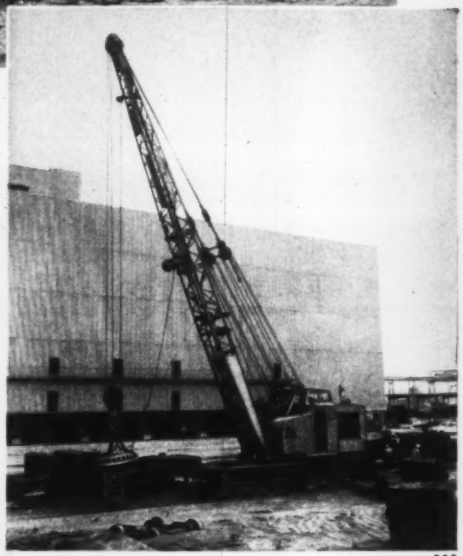
This installation is an example of the "money-saving" potential of LANDIS Taps. Their ability to tap at one pass large diameter coarse pitch threads requiring heavy metal removal in brass or steel reduces threading time. In addition, LANDIS Precision Tap Chasers produce a maximum number of pieces between grinds to further reduce "per piece" cost.

Various sizes of ALT Taps are available for threading all diameters from 1¼" to 13¼". Write for Bulletin G-94 for further information.

524

LANDIS *Machine* COMPANY WAYNESBORO • PENNSYLVANIA





ALL PARTS ARE INTERCHANGEABLE on Brownhoist's Diesel Electric Locomotive and Wagon Cranes

The 50 Ton Diesel Electric Wagon Crane and the 50 Ton Diesel Electric Locomotive Crane pictured here are two of several Industrial Brownhoist heavy-duty cranes operated by Kaiser Steel Co. at their huge plant in Fontana, California. Although these cranes operate at peak efficiency on a variety of rugged, daily jobs, it sometimes becomes necessary to replace parts. With Industrial Brownhoist cranes, either locomotive or wagon, part replacement is both swift and economical for every part is *interchangeable* from the car body up. The number of parts in your stock can be cut in half and down time for part replacement can be virtually eliminated.

If you need both a wagon crane and a locomotive crane for the heavy-duty jobs around your plant, get Industrial Brownhoist cranes. You, too, will benefit from the interchangeability of parts and such high performance features as exclusive 360-degree monitor-type cab, clear-vision boom, straight line power train and electric rotation for fast operation. Write for further information today.

208

BROWNHOIST

CLAMSHELL BUCKET

250 TON WRECKING CRANE

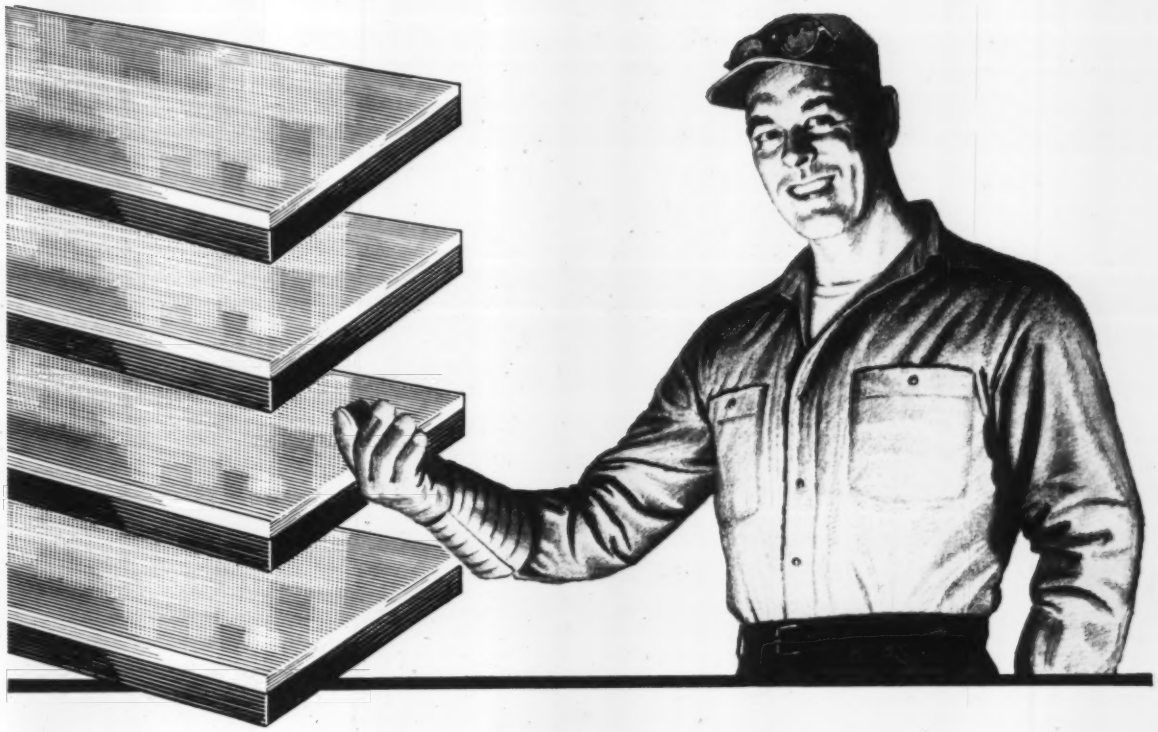
COAL-ORE BRIDGE

CAR DUMPER

LOCOMOTIVE CRANE

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: Cleveland, Philadelphia, Chicago, San Francisco, Montreal.

• **AGENCIES:** Detroit, Birmingham, Houston



The Image of CF&I . . . producer of

CLAYMONT
STAINLESS-CLAD PLATE

This giant steelman symbolizes CF&I . . . one of America's top-ranking primary producers of quality steel products. He reflects CF&I's pledge . . . "not merely to *sell* but to *serve*" . . . by supplying ever-improved products for industry's new and more demanding requirements. Products like CF&I-Claymont Stainless-Clad Steel Plate.

Claymont Stainless-Clad Plate . . .

- provides the same *protection*—against corrosion, abrasion or product contamination—as solid stainless steel, on applications where only one side of the plate is exposed to such wear factors.
- provides the *economy* of a carbon or alloy steel backing plate.
- is supplied in AISI stainless specifications 304, 304L, 316, 316L, 316Cb, 321, 347, 405, 410, 430 and ASTM specifications A-263 and A-264, plus others to meet special requirements.

The stainless cladding . . . from 5% to 50% of total plate thickness . . . is inseparably bonded to the backing plate.

Get full details from the CF&I sales office nearest you.

CF&I-CLAYMONT PRODUCTS: Carbon Steel Plates · Alloy Steel Plates · CF&I Lectro-Clad Nickel Plated Steel Plates · Clay-Loy High Strength Low Alloy Steel Plates · Flanged and Dished Heads · Manhole Fittings and Covers · Fabricated Steel Plate Products Large Diameter API Pipe

Claymont Steel Products

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CF&I STEEL

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque · Amarillo · Billings · Boise · Butte · Denver · El Paso · Farmington (N. M.) · Ft. Worth Houston · Kansas City · Lincoln · Los Angeles · Oakland · Odessa · Oklahoma City · Phoenix · Portland (Ore.) · Pueblo · Salt Lake City · San Francisco · San Leandro Seattle · Spokane · Tulsa · Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta · Boston · Buffalo · Chicago · Detroit · New Orleans · New York · Philadelphia

CF&I OFFICE IN CANADA: Montreal · **CANADIAN REPRESENTATIVES AT:** Calgary · Edmonton · Vancouver · Winnipeg 6921

In the automotive industry alone, there are 30 Cold Bonderite installations.

How Cold Bonderite System cuts costs

Some actual user-experiences of savings in heat requirements, maintenance, water and electricity, and equipment after installing Cold Bonderite System.

Less than two years ago, the first public announcement of Parker's Cold Bonderite System was made.

Now, well over a hundred plants are using this revolutionary, money-saving system of phosphate-treating at low temperatures.

Some are among the country's largest plants, others are quite modest in size and production. Products treated range the list from automobile bodies to small appliance components.

From these users we have compiled a long list of documented savings records. In many cases, cost reductions have been greater than we had hoped to achieve.

The temperature tells the story! Cold Bonderite System solutions operate 60° to 75° cooler.

Heat Saved

The greatest percentage savings in heat requirements (90%) has been reported by an automotive plant. Before installing Cold Bonderite System, the finishing line used 50,000 pounds of steam an hour. Cold Bonderite in the line uses only 5,000 pounds per hour.

In another auto plant, heat savings are figured at 74% on a body line. A small parts finishing line in the same plant shows the same percentage reduction in heat requirements.

A manufacturer of metal cabinets reduced gas consumption for heating his phosphating line from 33,000 to 14,000 cu. ft. per day—a 56% reduction—by installing the Cold Bonderite System.

A famous maker of household equipment changed from conventional phos-

phating to Cold Bonderite System and saw his steam use plummet 66%.

Another manufacturer, an Eastern small appliance maker, reports that on gas expense alone he has cut his phosphating costs 45%.

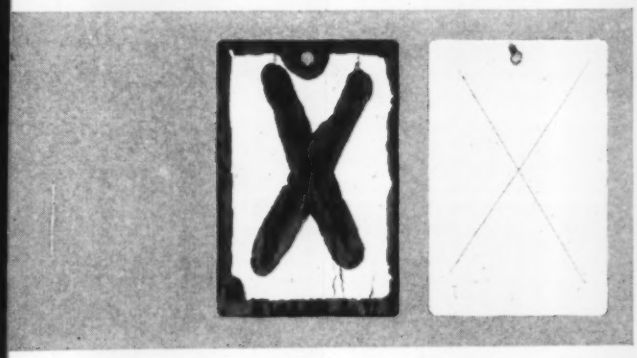
Other Savings Pile Up

The magnitude of other savings, beyond heat consumption, has been surprising to users and very good news to their cost accounting departments.

Electricity, for instance. At the greatly reduced temperatures of the solutions, there is no need to operate exhaust fans. In one installation, the change to Cold Bonderite eliminated the need for replacing a $15,000 exhaust system.

Water use is reduced about 25% because there is less evaporation.

Maintenance costs nosedive with Cold Bonderite System in the finishing line. Lower temperatures in the heating coils mean less frequent—or no necessity for—cleaning the coils. When there is service to be performed, the maintenance crew can move right in without waiting for the installation to cool off.



Comparative 48-hour salt spray test proves performance. Left, untreated panel; right, panel Cold Bonderite-treated before painting.

One user figures that he has eliminated 364 manhours of maintenance time yearly with his Cold Bonderite System.

The same manufacturer has discovered, too, that the reduced temperatures have allowed him to eliminate a number of steam traps and steam coils costing over $8,000.

Coating Quality Is High

While Cold Bonderite System is saving money on the phosphating line in these many ways, there has been absolutely no diminution of quality in the coatings or their performance.

The Bonderite coating produced by low-temperature Cold Bonderite System matches the high standards set by Bonderite for thirty years. In salt spray, humidity and outdoor exposure tests, as well as in actual service on automobiles, appliances, furniture and many other products, performance has been proven.

Results are uniform hour after hour and day after day. Control and operation of the system is simple and practically foolproof.

Chemical Costs Held Low

All the savings attained by the use of Cold Bonderite System are *real* savings. They show up on the P & L statement because *chemical costs for this revolutionary development are not increased.* The special Bonderites and Parco Cleaners are strictly comparable to conventional hot treatments in the cost of treatment per square foot.

Only Parker Has Cold System

There is, actually, no other system like it. Cold Bonderite System was developed by Parker research, tested and perfected by Parker chemists. It has been proven over and over again as the way to get superior phosphate coatings on steel with spectacular savings.

The Parker representative in your territory is ready to advise and work with you to change your phosphating installation over to Cold Bonderite System. Call him in or write direct to Parker, Detroit.

**Bonderite, Bonderlube, Parco, Parco Lubrite – Reg. U.S. Pat. Off.*

PARKER RUST PROOF COMPANY

2158 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base | BONDERITE and BONDERLUBE aids in cold forming of metals | PARCO COMPOUND rust resistant | PARCO LUBRITE—wear resistant for friction surfaces | TROPICAL—heavy duty maintenance paints since 1883

THE MARK OF QUALITY

BARBER COLMAN

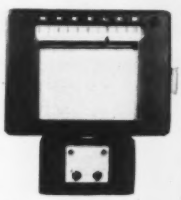
Wheelco Instruments

Here's a combination of advanced

Five 3000 Series indicating controllers with 3-function control form and two 8000 Series multipoint recorders are included on the Wheelco instrumentation provided.

FIELD-PROVED WHEELCO INSTRUMENTATION

Up to 24 points are recorded at speeds of 3 to 24 inches per hour on Wheelco 8000 Series multipoint recorders. Multibank (scanner) setups permit recording 144 or more points with a single instrument.



Constant voltage source proved in more than three years of field operation and 3-function control form for proportional reset and rate action make Wheelco round and strip chart recorder-controllers outstanding.

Wheelco 400 Series millivoltmeter controllers offer a choice of six control forms. Only Wheelco offers 3-function control on a low-cost millivoltmeter controller assuring peak performance, maximum economy.

Instrumentation and furnace design

Wheelco instruments provide precise 5-zone temperature control for Lindberg's giant gantry-type furnace

There's nothing commonplace about this gantry-type furnace built by Lindberg Engineering Company to handle not only the heat treatment of today's metals for aircraft and missiles but those of the future as well . The giant furnace, installed at Lindberg Steel Treating Company, is electrically heated and has five temperature control zones to insure maximum temperature uniformity over the entire range of 250°F to 2050°F.

Five Wheelco Model 3000 indicator-controllers, each equipped with an MMC magnetic modulated three-function control, provide the ultra-precise temperature control needed for work up to 24 ft long and 6 ft 8 in. diameter. These instruments working with magnetic amplifiers and saturable core reactors provide stepless control over the entire temperature range. Two 8000 Series Wheelco multipoint recorders, one for 0-1200°F range and one for 1000°F to 2200°F operation provide an accurate, permanent record of furnace temperatures.

More and more process equipment builders are proving that Wheelco instrumentation insures greater accuracy and flexibility in process and control and provides these advantages on standard, field-proved instrumentation. As shown below, Wheelco recorder-controllers and indicating controllers are available to fit a variety of needs and incorporating such features as Wheelco's thoroughly proved constant voltage source as standard equipment plus three-function control forms to meet the most exacting processing requirements. Get more data from your nearby Wheelco field engineer or write to address below.

BARBER-COLMAN COMPANY

Dept. R, 1596 Rock Street, Rockford, Illinois, U.S.A.

BARBER-COLMAN of CANADA, Ltd., Dept. N, Toronto — Export Agent: Ad Auriema, Inc., New York

Industrial Instruments • Automatic Controls • Air Distribution Products • Aircraft Controls • Small Motors
Overdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

FOR BETTER PROCESS CONTROL

2000 Series round chart recorders have pen sweep speeds of 1, 4 and 20 seconds at 60 cycles. Instrument accuracy is ¼ of 1% for all scale spans in pyrometric range. Available with 3-function control form.

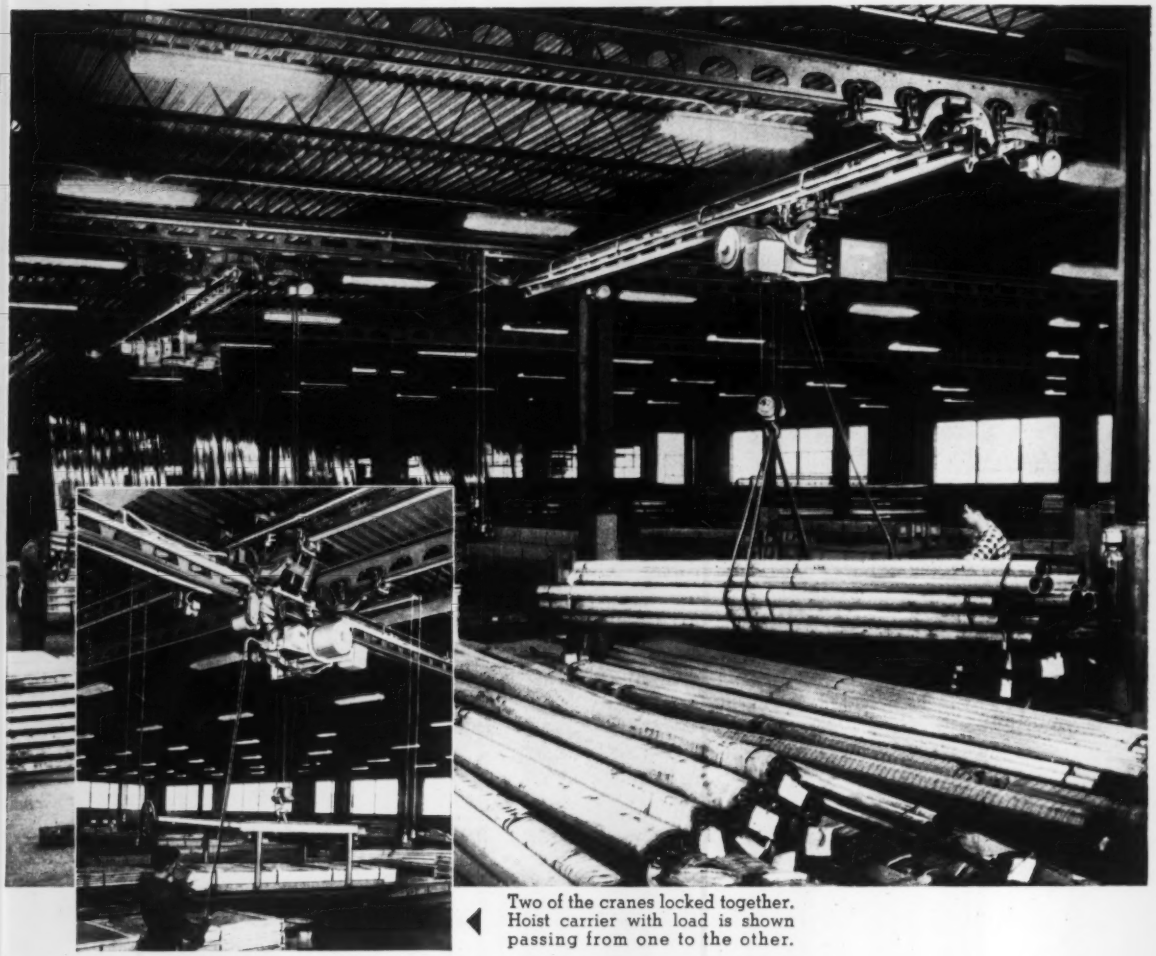
3000 Series circular scale indicating controller offers a large, bold, distant-reading scale. Sensing elements (same as 8000 and 2000 Series instruments) include thermocouples, radiation pyrometers and transducers.

COMPLETE CONTROL CENTERS

Wheelco-designed and built control centers are available to meet every type of process control need. Installation time and costs are reduced materially when a prewired, prefabricated control center incorporating all instruments in an attractive panel board or heavy steel cabinet is provided by Wheelco.

Large bundles of pipe, sheets, etc., are quickly handled from receiving dock to any spot in the warehouse *without rehandling* by the overhead Cleveland Tramrail transfer cranes. Whitehead Metal Products Co., Inc. specialize in a wide variety of nonferrous metals.

TRAMRAIL CRANES
SAVE WAREHOUSE SPACE
Improve Materials Handling Efficiency



Two of the cranes locked together. Hoist carrier with load is shown passing from one to the other.

In the large modern warehouse of Whitehead Metal Products Co., Inc., Cambridge, Mass., the entire job of unloading incoming materials, placing in storage and handling for outgoing shipments is done with Cleveland Tramrail transfer cranes.

The cranes have proven most practical for this service. They can transport long, unwieldy bundles of pipe in much narrower aisleways and turn them ninety degrees for piling without need of wide turnaround areas. As a result, an important amount of floor space is saved, and this provides considerable additional storage capacity.

Three cranes on separate, adjacent runways are used at Whitehead. However, there are only two hoist carriers, one of two tons, and the other of three tons capacity. Either can be transferred to any crane. The equipment is completely motorized, push-button operated. Conductors are SAFPOWRBAR. (SAFPOWRBAR electrification has been approved by the Underwriters Laboratories, Inc. and the Canadian Standards Association.)

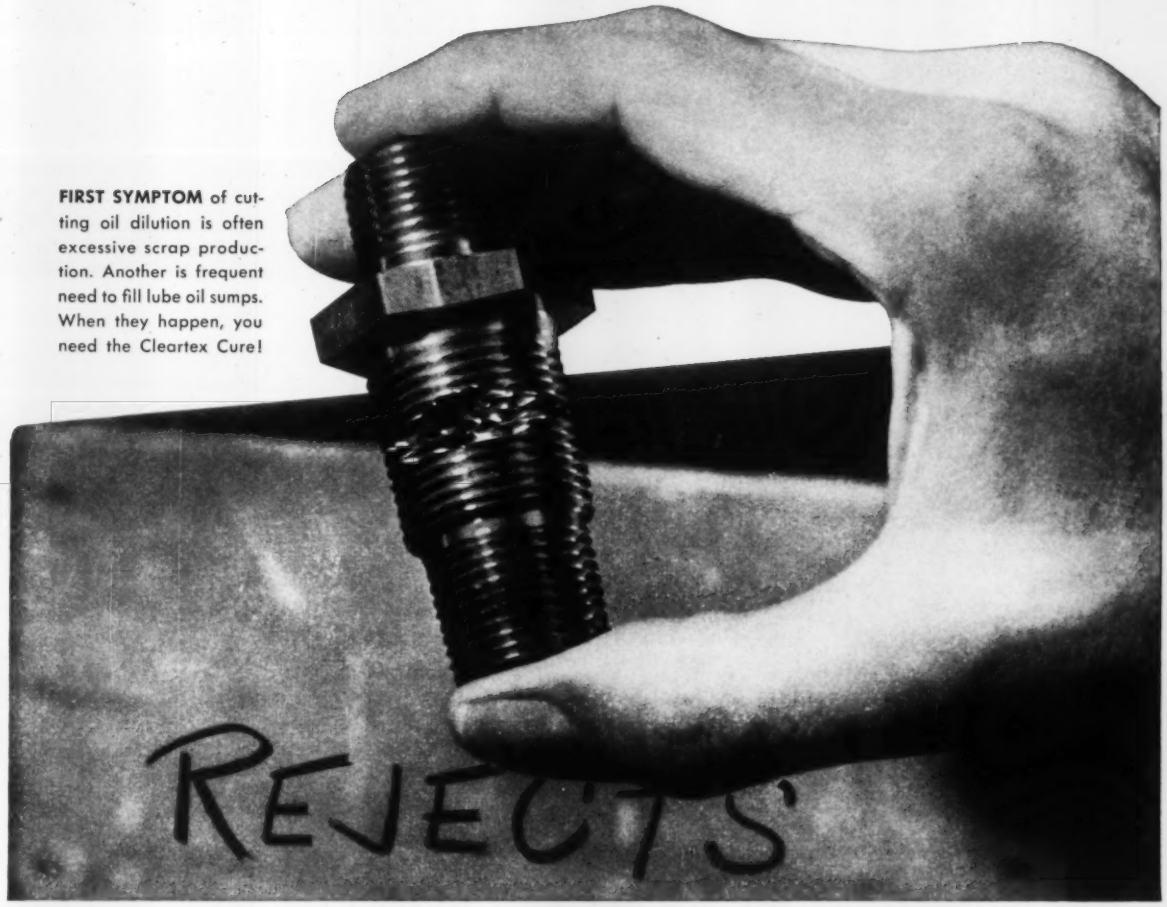
Hundreds of warehouses handling materials of nearly every kind are profiting by installations of safe, dependable, time-saving Cleveland Tramrail cranes and track systems.

Write for free Engineering and Application Booklet No. 2008. Packed with valuable information.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 7845 E. 290th St. • WICKLIFFE, OHIO



FIRST SYMPTOM of cutting oil dilution is often excessive scrap production. Another is frequent need to fill lube oil sumps. When they happen, you need the Cleartex Cure!

Diluted cutting oil can pile up rejects

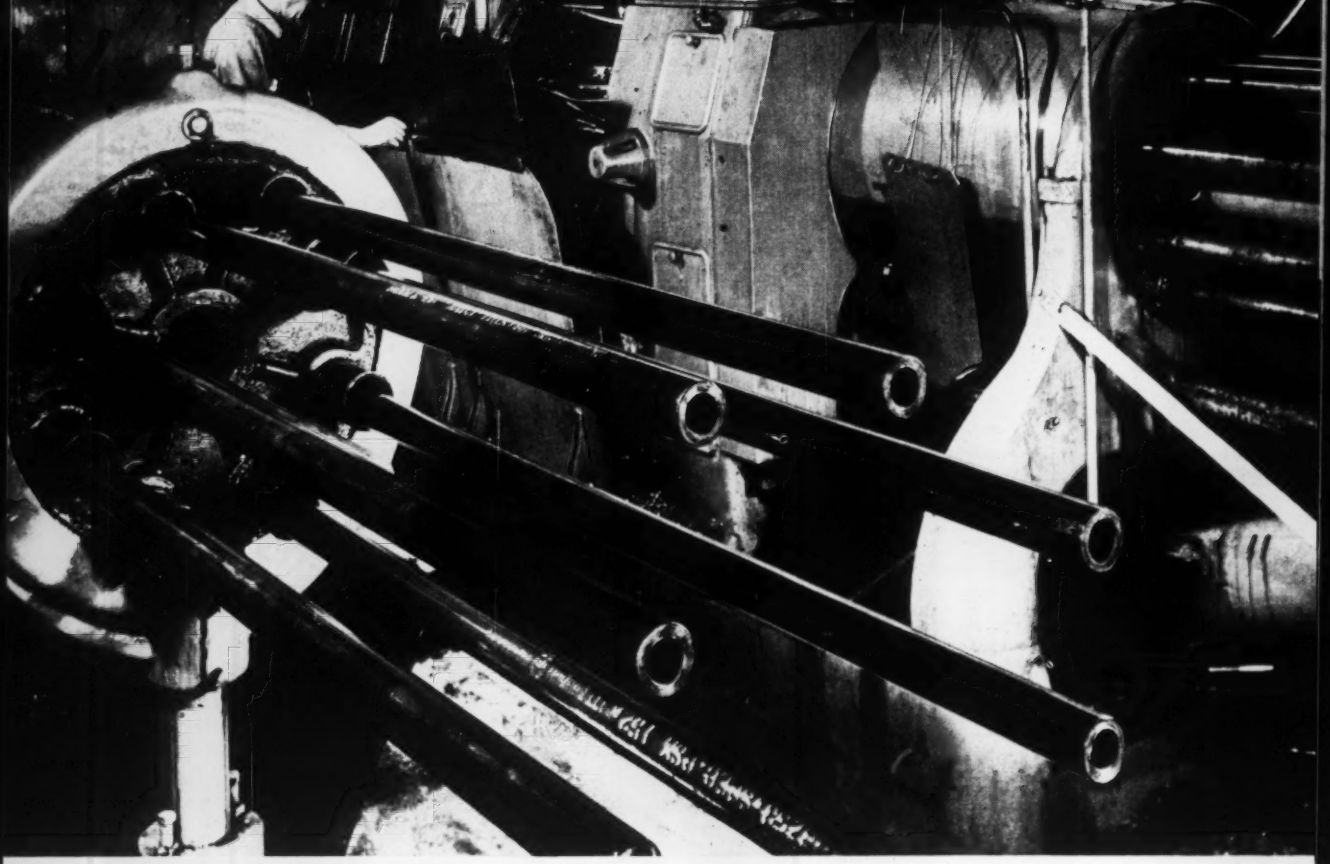
When you find your scrap production soaring, the villain may be lube oil leaking into the cutting oil sumps of your automatic screw machines. It happens in 7 out of 10 automatics in spite of the most careful lubricating techniques. This dilution will lower cutting oil effectiveness—and, as it loses its efficiency, rejects pile up, tool life drops, and production can go down by as much as 33 per cent!

Texaco Cleartex can solve the problem—forever!
Because of its exceptional stability and load-carrying ability, Cleartex can function *both* as a cutting oil *and* as a lubricant —and even as a hydraulic fluid. When *all* your automatics' sumps are filled with Cleartex, unavoidable leakage is no longer a problem. Excessive scrap production will stop, tools will last longer and production will go up.

TAKE THE "CLEARTEX CURE" SOON!
Write today for your copy of Texaco's new booklet—"Cleartex in Automatic Screw Machines." This new illustrated guide will fill you in on the details, show you where you may be losing profits and how to avoid it. Or contact your local Texaco Lubrication Engineer for an authoritative survey of your automatics. Just call the nearest of the more than 2,000 Texaco Distributing Plants, or write:

Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. S-FM-31.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)



Bearings in the making are these lengths of Pittsburgh seamless mechanical tubing in the charging rack of a high-speed automatic cutting machine at the plant of a leading bearing manufacturer. Special machining, hardening properties are built into tubes for this customer who produces more than 6,000 inner-rings per day.

Leading Bearing Maker Finds . . .

Machinability of Pittsburgh Steel's Tubes Lengthens Tool Life, Gives More Pieces

One of the nation's oldest and largest ball bearing makers used alloy bars for high-speed machining of a difficult bearing part for 20 years.

But when Pittsburgh Steel Company showed how low-carbon steel tubes could provide the machining and case-hardening properties required, this big-name manufacturer switched to Pittsburgh seamless mechanical tubing.

These were the clinchers:

- **More pieces per day**
- **Longer tool life**
- **Less machining and scrap**
- **Lower cost material**

The part involved was the inner-ring of a clutch throw-out bearing—a heavy production item at this customer's biggest plant since 1937. The bearing is the part that takes the abuse from the spinning clutch pressure-plate when you step on the clutch pedal.

To produce the inner-ring from low carbon steel, the customer demanded seamless tubing that was:

Highly machinable and uniform—for charging into a battery of 8-spindle automatic screw machines which subject each piece to 16 cutting operations.

Exceptionally hardenable and fine grained—for heat-treating to the hardness demanded of bearing steel and for finishing to ultra-close tolerance and super-fine surface.

The customer specified the grade of steel he needed to obtain these properties—AISI C-1024—then asked Pittsburgh Steel's sales engineers to produce it in seamless mechanical tubing.

The bearing maker's automatic machines produce 6,000 to 6,500 bearing inner-rings a day, testing the tubing's machinability with cutting tolerances as little as .003 inch.

Its hardening properties are

hardening-temper cycle.

Structural characteristics meet the test in an integrated finishing-assembly operation that includes grinding and honing, and two 100 percent test operations.

The bearing maker's superintendent of primary operations sums up the advantages of Pittsburgh Steel's mechanical tubing this way:

"We get more pieces during a day's operation. And we don't have as many chips to pull.

"We can use a boring tool and this stays in service longer than the drill needed for bar stock. Other tools used for ID cuts also stay in longer. So there we have lower tool costs.

"Finally, we are using a less expensive steel and gaining cycle speed. Since the inside drill speed is the controlling factor on cycle speed for bar stock, the elimination of this operation and the substitution of a boring tool permits cycle speeds of 25 seconds for tubing compared with 28 seconds for alloy bar stock or a little over 10 percent reduction."

This customer's experience with Pittsburgh Steel's seamless tubing—the advantages, the quality, the results—is typical of Pittsburgh Steel's ability to supply tubular products for special applications and of its ability to help customers obtain more profitable production.

These same benefits can be tailored to the needs of your operation requiring seamless mechanical tubing or any of the other tubular products made by the skilled tubemakers at Pittsburgh Steel Company.

Initial assembly—one of two 100 percent testing operations—is where seamless shows its merits in finished bearing.

Tubing proves its machinability here where it takes 16 boring, reaming, grooving, recessing and burnishing cuts.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
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Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

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Atlanta, Chicago, Cleveland, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

THE OTHER TURN

THERE'S DUTCH CONKED OFF AGAIN. THAT MAKES THREE DAYS THIS WEEK.
YEAH, AND ONE DAY LAST WEEK HE GOT PAID OVERTIME FOR SLEEPIN' HALF WAY THROUGH THE NEXT SHIFT.
- BET HE'S HAVIN' HIS FAVORITE DREAM AGAIN, THE ONE ABOUT MAKIN' BOTTOM WITH CRACKED ICE AND CHARGIN' CANNED BEER!
ZZZZZ
KUEKES

THANKS TO
JOE TURNER
L.F.M. MANUFACTURING CO.
DIVISION OF
ROCKWELL MANUFACTURING CO.
ATCHISON, KANSAS.

The Dreamer

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

Magnefer and Syndolag Set Fast—Stay Fast

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

Steel Inventories Will Outlast 30 Day Strike

If the United Steelworkers walk out on July 1, few steel consumers will be hurt for a month. After six weeks, many consumers would be in trouble because of imbalanced stocks. After eight weeks, shortages would force mass shutdowns. That's what STEEL discovered in a survey of steel buyers (Page 59). Since Jan. 1, customer inventories have grown from 13 million to 19.5 million tons. By June 30, about 21 million tons will be stocked. Automakers will have nearly 90 days' supply; appliance people will have around 60 days.

Britons Cut Steel Prices

The British Iron & Steel Board last week announced a 2 per cent price reduction (about $2.80 a ton) on shipments of 10 tons or more (Page 140). It means tougher foreign competition for U. S. producers. And it applies even more pressure on U. S. industry to hold wages down. British steelmen say the move was made to encourage buyers to place larger orders. That would make longer production runs possible and result in greater production efficiency. The move may save British steel buyers $33 million a year, say some trade experts.

Aluminum's Going Places

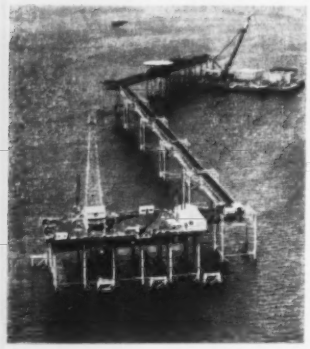
Expect U. S. aluminum to reach 4.2 million tons annually by 1965 and 10 million tons by 1975. Current annual production: About 1.9 million tons. A STEEL survey shows that 73 per cent of aluminum users will boost their consumption during the next five years; 1 in 10 nonusers will switch to the light metal. It stands on the threshold of major new automotive uses, faces a booming packaging market, looks to steady growth in marine and electrical applications (Page 103).

Where Foreign Steel Comes From, Where It Goes

Most of the imported steel coming to the U. S. via the St. Lawrence Seaway is destined for Buffalo, Detroit (often via Toledo), and Chicago. Wire and rebars are the predominant products. West Germany, France, Belgium, and Great Britain are major nations of origin. Italy sells a little;

Sweden is shipping specialty products. European producers apparently think that Chicago can become one of their best markets because some mills reportedly will set up direct sales offices there. In Cleveland, the three biggest buyers of foreign steel are a fastener maker, a warehouse, and a structural steel firm. As an example of the quantities coming in: 2500 tons entered via Detroit from May 18 to 22. In just one shipload, Chicago on May 13 received 6600 tons of bars and channels from Belgium.

Islands of Steel: Rejuvenating an Old Market



Offshore mineral development shows signs of shaking out of its doldrums. Recent Louisiana underwater leases brought record bids (up to $3000 an acre). It signals the rebirth of a good market for steelmen and other oil country suppliers (Page 137). And it may continue good for some time. Over the next decade, experts forecast a 63 per cent jump in U. S. oil needs and a 111 per cent leap in foreign consumption. It means brighter long term prospects for shipbuilders.

World Steel Production Sets Record

World steel production rose to an annual rate of 350 million net tons during 1959's first quarter, reports the Commerce Department. That's 49 million better than '58 and 28 million better than the previous record, set in '57. The U. S., Canada, Russia, Japan, and China were the major countries with gains. European Coal & Steel Community didn't hit its '58 pace.

More Metalworking Money Moves Overseas

Continent hopping is becoming standard duty for many metalmen. Reason: The significant shift in the type of private, long term investments abroad. In the 1920s, most American money went into portfolio investments, which imply no important implication in management decisions. Today, most money goes into direct investments, where ownership of more than 25 per cent of the business is usually involved (Page 74).

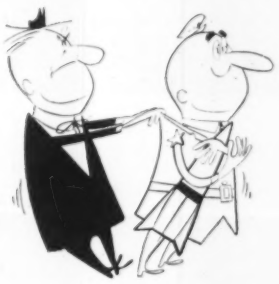
Steel Chiefs Disagree on Third Quarter Prospects

If there were no steel strike, what would be the industry's third quarter operating rate? Inland Steel Co. would run at better than 80 per cent of capacity, believes Joseph L. Block, chairman. Youngstown Sheet & Tube Co. could operate at 70 per cent or better, reports J. L. Mauthe, chairman. But Roger M. Blough, chairman, U. S. Steel Corp., said his company's rate would drop to 60 per cent. And Charles M. White, chairman, Republic Steel Corp., said his firm's third quarter would be "not very good," because "everybody has built up inventories."

Everybody—Doctor, Lawyer, Merchant, Chief—in Steel Act

In Gary, Ind., a doctor, lawyer, merchant, and Indian chief have decided that a 4½ cent an hour pay boost for steelworkers would be noninflationary. Dr. M. R. Marshall, Attorney G. W. Hulbert, Merchant A. J. Feinberg, and Chief Lone Eagle sent their message to President Eisenhower, R. Conrad Cooper (chief management negotiator), and David McDonald, USW president. Gary area churches are conducting "a prayer crusade for peace in the steel industry."

Congress Will Tighten Reins on Defense Spending



Look for Congress to slice about $400 million from President Eisenhower's defense budget for fiscal 1960 (Page 68). The Army stands to gain ($222 million); two services will lose (the Navy $83 million; the Air Force $539 million). Reason: Congressmen are placing more emphasis on the long term projects, less on the short term ones. They also charge the Pentagon with bickering, confusion, and duplication.

Goldwater Blasts Labor Power

The unworkable labor conditions forcing Electric Auto-Lite Co.'s La Crosse, Wis., plant to close is just one more example of the abusive power exercised by some labor leaders, declares Sen. Barry Goldwater (R., Ariz.). Auto-Lite will close the plant July 3 because of the "severe handicap" its UAW labor contract placed on it. Local union leaders ignored a plea from the company at last winter's contract negotiations.

Group Thinking Aids New Product Development

Expect the committee approach to become even more popular in new product development (Page 65). It has been paying off for many firms. Example: Rockwell Mfg. Co., Pittsburgh. An active search for new profitmakers (Example: radial saw) has won Rockwell new markets (it's now the second largest maker of radial saws) and boosted its sales by 35 per cent in six years (1952-58).

Werner von Braun Asks for Better Materials

Missile and supersonic aircraft designs are being limited by the nonavailability of suitable materials, reports Dr. Werner von Braun. So designers use composite materials, unorthodox designs, unusual fabrication techniques, and sometimes disregard commonly accepted safety margins. Adds Dr. Von Braun: Although aluminum makes up about 90 per cent of the total airframe weight of our larger missiles, it doesn't mean that aluminum will continue

to dominate the field. The metal begins to suffer measurable loss of strength above 400° F.

Reliability: Why SPS Emphasizes It

If the product you make has 100 parts, and each part will function perfectly 99 times out of 100, your product will probably fail six times out of ten. That's the law of probability. Such mathematics is becoming an important sales tool for Standard Pressed Steel Co., Jenkintown, Pa. It's teaching its customers' purchasing agents the reliability formula. You may want greater reliability. Take a tip from SPS's approach (Page 64).

Is Radar Obsolete?

Radar can't protect us, says the "father of radar," Sir Robert Watson-Watt. He contends that the U. S. is wasting its money on three systems that depend on radar for their effectiveness—an antimissile missile like Nike-Zeus, the ballistic missile early warning system (BMEWS), and the air defense control system (SAGE). Sir Robert says a better approach would be through communications satellites. The Nike-Zeus full program reportedly would cost $5 billion; SAGE and BMEWS will run $8.7 billion if plans for the next four or five years are carried through, reports a Pentagon source.

Australia Sees Big Investment Gains Coming

Australia looks for a 20 per cent rise in investments from overseas during the fiscal year beginning June 30. New in the picture is Japan. Non-Australian interests are already putting $275 million a year into the country; about $330 million is slated for the coming fiscal year. One reason: Australia claims the world's lowest unemployment rate. Spending for plant and equipment during 1959's first half is running about 12 per cent higher than during 1958's last half.

Raytheon Plans 'Cabin in the Sky'

Sky stations, hovering in fixed positions in space are being planned by Raytheon Co. Power will be transmitted from a ground generating plant. It will be generated by a battery of amplitron tubes (now used in air traffic control systems) and beamed upward by antennas grouped in a 400 ft square array, coming to a focus about 100 ft in diameter at the sky station.

Straws in the Wind

The Baltimore & Ohio Railroad is leasing $3.5 million worth of equipment (1350 pieces) and has reached an agreement for the rearrangement of union track forces that will bring about "100 per cent mechanization of track maintenance by June 16" . . . Prices of light bulbs will be boosted up to 16 per cent the end of this month . . . Convair Astronautics won a $33.5 million contract to build the Vega, a vehicle that's scheduled to hurl a 2 ton, manned laboratory into space . . . Union Carbide Metals Co. is studying the feasibility of a new atomic fuel element (uranium carbide clad with columbium) . . . Lockheed Aircraft Corp. has developed an international version of its F-104 Starfighter and is trying to sell it to Western powers.

Slammin' Sam Snead fails to flake Inland TI-CO®

As one of golf's great players, Slammin' Sam earned his name and fame with a driving power that has seldom been equalled. His swing is deceptively easy —yet it drives the ball with astounding force and speed. At Boca Raton, Sam drove ball after ball into an Inland TI-CO galvanized sheet. Each impact was terrific. One would expect such punishment to be devastating, yet, though the TI-CO sheet was battered and dented—*there was no flaking of the zinc coating whatsoever!*

All year 'round in product fabrication and assembly; in a limitless variety of commercial and residential applications; Inland TI-CO regularly takes equally tough treatment—deep-drawing, spin-drawing, Pittsburgh lock-seaming, crimping, punching, hammering—*without cracking, peeling or flaking!*

Sam couldn't believe it either 'til he examined the TI-CO sheet for himself. *Not a trace of flaking!*

Consult your Inland Representative regarding *your* galvanized sheet or coil requirements. And send for your free TI-CO booklet containing technical data and complete information. TI-CO is produced with dry, oiled or chemically treated surfaces in sheet and coil form in a wide variety of gages and widths.

INLAND

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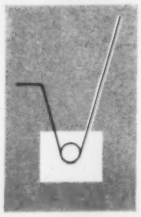
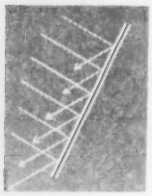
ARMCO
ALUMINIZED STEEL
TYPE 1



Sturdy steel coated with aluminum by a patented hot-dip process. No metal of comparable price can match ALUMINIZED STEEL Type 1 in resistance to destructive combinations of heat and corrosion.



The surface of this aluminum-coated steel reflects up to 80 per cent of radiant heat. It's used to "save" heat (hold it in) or to direct heat where it's wanted.

ALUMINIZED STEEL will withstand moderate forming, drawing or spinning operations without flaking or peeling

of the coating. Costs stay low because ALUMINIZED STEEL needs no further finishing after fabrication. Twenty years' experience by hundreds of manufacturers shows that products and parts made of ALUMINIZED STEEL mean service savings too—through longer life, more efficient operation.

For information about this aluminum-coated steel originated by Armco, write: Armco Steel Corporation, 2469 Curtis Street, Middletown, Ohio.

New steels are born at Armco

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Inflation: Our Gravest Danger

The gravest danger of our times is the creeping inflation eroding away the value of the dollar.

Today, the dollar of 1947-49 is worth less than 84 cents in terms of wholesale prices.

The dollar of 1937-39 is worth less than 45 cents.

The dollar of the 1933 depression is worth less than 35 cents.

The dollar is worth even less in terms of many things industry must buy and replace.

For example, Republic Steel spent $33 million on three new coke oven batteries at Cleveland. It will spend another $10 million for coal handling equipment.

The new ovens replaced four old batteries originally costing $1 million each. Republic recovered the $4 million as depreciation but must provide the balance ($40 million) out of earnings or new financing.

The same type price inflation has affected every business and every individual whether it is applied to machine tools, automobiles, or shoes.

It has eroded the value of savings accounts, government bonds, insurance policies, and retirement benefits.

It has inflated common stock prices out of proportion to their earnings. It has cost the U. S. a large share of its export market.

Now the dollar is under further attack by labor. With its monopoly power, it can insist on keeping the wage-price spiral going even contrary to the wishes of the rank and file.

Management needs to do two things:

1. Resist demands for wage increases that are out of line with increased productivity.

2. Do everything in its power to help dispel the myth that "a little inflation is good for the country."

People are apathetic to the real dangers of inflation because, like an opiate, it is so insidious.

Irwin H. Such

EDITOR-IN-CHIEF

As the strike deadline nears what can you count on from Ryerson?

As this is written we can only hope, as everyone does, that a steel strike can be averted. However, if there is a strike here's the assurance we can give you of cooperation from Ryerson.

Long before the current heavy demand developed, Ryerson began building up inventories to meet any eventuality. So we entered the second quarter with stocks at an all-time high—by far the nation's largest in tonnage, types and sizes.

Although demand has been exceptionally high we are currently able to meet most requirements and expect to reach mid-year with much larger stocks than we have ever had in any comparable period. So, with few exceptions, we should still be able to take care of your needs.

Naturally, if steel is not being produced our stocks will not last indefinitely, but it's still a safe bet that you will be able to get what you need at Ryerson—if you can get it anywhere. You can also count on Ryerson to maintain its regular policy of fair published prices and to furnish steel that is always of high, uniform quality.

Your Ryerson representative is well qualified to review the facts and help you get the maximum for your steel-buying dollars. Ask him to analyze your requirements with you the next time he calls.

STEELS IN STOCK

CARBON STEEL BARS
Hot rolled and cold finished

STRUCTURALS
Channels, angles, beams, etc.

PLATES
Forming and welding, flange and firebox qualities, high carbon, E-Z-Cut, etc.

SHEETS & STRIP
More than 20 types

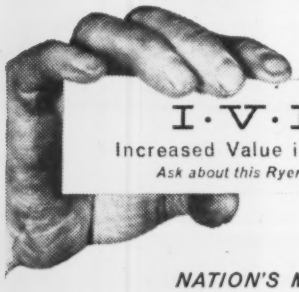
TUBING
Seamless and welded mechanical, hydraulic cylinder and fluid line, structural, etc.

STAINLESS STEEL
Sheets, plates, bars, tubing, pipe and fittings. 15 types, standard and aircraft qualities.

ALLOY STEEL
Case hardening, direct hardening and heat treated, Rycut leaded alloys, aircraft quality alloys, etc.

CONSTRUCTION STEELS
Re-bars and accessories, spirals, wire fabric, open web joists, etc.

TOOL STEEL
Water and oil hardening.



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Ask about this Ryerson Plan for 1959

RYERSON CERTIFIED QUALITY

RYERSON STEEL®
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STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

If We Have 3-Month Steel Strike, Inventories Will Change Like This:

(Millions of net tons)

	SHIPMENTS*	CONSUMPTION	BUILDUP	INVENTORY
12-31-58				13.0
JANUARY	6.3	6.1	0.2	13.2
FEBRUARY	6.6	6.1	0.5	13.7
MARCH	8.2	6.4	1.8	15.5
APRIL	8.5	6.6	1.9	17.4
MAY	8.9	6.8	2.1	19.5
JUNE	8.5	7.0	1.5	21.0
JULY	**1.4**	**7.0**	**—5.6**	**15.4**
AUGUST	**1.3**	**6.0**	**—4.7**	**10.7**
SEPTEMBER	**1.1**	**4.0**	**—2.9**	**7.8**

*Includes imports (averaging 240,000 tons a month through July; 400,000 tons a month in August and September).

STEEL INVENTORIES are increasing steadily in spite of the rising trend in consumption.

If the United Steelworkers hit the bricks on July 1, few users will be hurt for a month. After six weeks, many consumers will be in trouble because their stocks are out of balance. After eight weeks, shortages will force mass shutdowns.

Since the first of the year, users have upped their inventories from 13 million to 19.5 million tons. By June 30, they'll have about 21 million tons in stock—9 million more than they had last September (when liquidation ended), but 4 million less than they had on the eve of the 1956 strike.

But more important than statistics on inventory totals is the question, "Who has what?"

• **Big Users Well Fixed**—After a long strike, big customers sometimes press steelmakers to accept union demands that they might otherwise resist. This year, there shouldn't be much pressure from the automotive industry, steel's biggest customer. The recipient of 23.2 per cent of domestic shipments, it warned its suppliers in January to get set for a 90 day strike.

Although it has only 45 days' supply of flat-rolled material, Chrysler Corp. expects to double its inventory by the end of the month. L. L. Colbert, president, says his firm will have enough steel by June 30 to finish the '59 models and make a good start on next year's.

Fisher Body Div. of General Motors Corp. is still shooting at a 90 day inventory and expects to reach its objective.

Of the Big Three, only Ford Motor Co. seems to be in jeopardy. Sales have surpassed expectations, forcing it to divert steel bought for stock to immediate production. "We're a little behind our target inventories," a buyer admits, "but we hope to be up there by the end of June."

If Ford and other large consumers get all of the tonnage they're counting on this month, it'll be only because steelmakers had extraordinary co-operation from men and machines: No furnace breakdowns, wildcat strikes, slowdowns, or transportation tieups. Last month, Ford had trouble ordering an extra 10,000 tons of sheets for June delivery. Although it has its own steel plant (with a United Autoworkers contract), the company probably can't supply more than 40 per cent of its current requirements. Operations are close to capacity, so it's unlikely that they could be stepped up enough to fill the void.

• **Appliance Makers Loaded**—Like the automotive companies, major

appliance manufacturers have been hedging against a steel strike for months. "Our suppliers are 10 to 14 days behind on sheets," an industry leader reports, "but we're not worried. Even if we don't get everything we ordered for June, we'll have enough steel for at least 60 days. I don't think we'd have any real trouble for three months." Adds a midwestern competitor: "Our inventory will outlast a strike of six to eight weeks. Since we've scheduled a two week vacation for late July, we're pretty well set for two and a half months."

Other buyers who are well prepared for a break in steel production are the canmakers, oil producers, and service centers. Because their shipments jumped about 10 per cent last month, warehouses weren't able to expand their inventories. By June 30, their stocks may drop from the current 3.6 million tons to the Jan. 1 level of 3.4 million. But even if they do, they'll be 36 per cent larger than they were at the time of the 1956 strike.

• **Components Important**—Big inventories in the mass production industries won't guarantee uninterrupted operations during a steel strike unless component manufacturers have ample stockpiles too. In the case of the automotive suppliers, there should be no problems. Those that don't have 90 day steel inventories probably have big enough stocks of finished goods to make up the difference. Asked whether he had much steel on hand, a fastener maker replied: "We can still get through the aisles." A Chicago muffler and tailpipe manufacturer says it can keep going three and a half months.

• **Where Stocks Are Low** — Although most consumers will have little to fear for the first six weeks of a strike, some will be in trouble by the end of July because: 1. They were left at the post when the buying rush began. 2. They underestimated their first half requirements; business picked up so rapidly that they had to use steel bought for inventory as soon as they received it. 3. They needed hard-to-get items. 4. They didn't have the money or couldn't afford to tie it up in inventory.

Railroad carbuilders will be in a tight spot because they started late and needed material that wasn't readily available (plates and light structurals). Structural fabricators didn't increase their inventories much because they lacked cash and didn't know what they'd need. Builders of machinery, earth moving equipment, and farm implements will fall short of their inventory objectives. Miscellaneous users, especially the small companies, are short on hot rolled, cold rolled, and galvanized sheets.

Little Progress in Steel Talks

THE UNITED STEELWORKERS has not given specific demands to the steel companies after more than a month of negotiations.

The union has presented economic arguments for substantial wage increases and higher fringe benefits, but it has not spelled out "substantial" or "higher."

The industry bargaining team is now presenting its economic arguments for a one year extension of the labor contract, with no change in wages or benefits and the elimination of the cost-of-living provision.

• **Labor's Argument**—The USW bases its case on profits and productivity. It claims "high" earnings in the steel industry make it possible for the companies to afford higher employment costs without passing the increase along in their prices.

The union claims marked improvement in output per manhour (its definition of productivity) also justifies wage and benefit boosts.

• **Industry's Position** — The companies' case—reiterated last week by Republic Steel Corp.'s chairman, Charles M. White, and President Thomas F. Patton—is this: Steel's hourly employees are the highest paid industrial workers in America except for the relatively small number of makers of flat glass. The average autoworker gets 38 cents an hour less.

To show why Republic needs profits, the executives pointed out that their firm is replacing four old batteries of coke ovens built at a cost of $4 million with three new batteries which will cost $43 million with auxiliary equipment. Inadequate depreciation allowances force Republic and every other steel company to go to profits to finance such replacements and expansions.

Republic and the industry argue that the union's definition of productivity is inadequate; productivity gains involve the improvements in machines and managerial skills, as well as increased contributions by the men using the equipment. Workers are not entitled to get all the benefits of higher productivity because they are responsible for only part of the increase.

• **Selective Strike?** — Mr. Patton "would be surprised" if the steel union decides to strike just part of the industry.

Will President Eisenhower invoke the 80 day, cooling off provision under Taft-Hartley? Nobody knows yet, but Mr. Patton believes that, if it is invoked, the President wouldn't ask for it unless a strike has been going on for some time.

• **Will We Have a Strike?**—Republic's and the industry's executives hope not, but there was gloom last week about the lack of progress.

About the only optimism you can find is among some government officials. They profess to believe that the Presidential pressure and press conference statements will help lead to settlement by June 30. "Neither side wants a strike," one Washington man points out.

"That's true," say Messrs. Patton and White, "but we can't go on granting wage increases and passing part of them on in the form of price increases." They're alarmed about the rising competition from other materials and from foreign steel. (Jobs of 170,000 U. S. metalworkers are jeopardized by wages so high they cannot meet foreign competition.) They and other steel officials make it clear they're in a showdown fight.

Socialist Target: British Steel

The Labor Party has issued a policy statement urging the renationalization of the steel industry. It says: "The pretense that control is exercised by shareholders is a mockery . . . Bankers and accountants frustrate engineers attempting to use their creative ability to serve the nation . . . Instead of improving efficiency and productivity, the companies' prime interest is in making attractive 'buys' for speculators . . . Directors can ignore national considerations and small shareholders as long as they provide profits for the banks and insurance companies . . . Public ownership is the best protection against private monopoly . . . Only the state can provide capital for an expanding industry and insure that supply and demand match." Here's the situation as the socialism vs. capitalism debate flares again.

World Steel Production and Capacity 1958

(Millions of tons)

Country	Production	Capacity
United States	85	141
USSR and East Europe	79	81
Common Market	64	74
United Kingdom	22	27
Japan	14	15
Commonwealth (except UK)	12	13
China	12	12
Rest of World	14	16
Totals	302	379

Source: British Iron & Steel Federation.

CONTROVERSY over public vs. private ownership of the British steel industry shows no sign of abating.

The Conservatives, after ten years in power, must hold an election by 1961. They are likely to call one before then, using their ups and downs in popularity to advantage. The Labor Party has entered the political arena favoring renationalization, charging the Conservatives "have made a muddle in steel." Private enterprise proponents attack "constant sniping" by Socialist propagandists at the directors of over 300 companies employing 300,000 workers. They say the threat of nationalization discourages investors.

• Britain has accepted some degree of public supervision in the industry since 1932.

A protective tariff was effected in that year to help the depression ridden steelmakers. (Profit on capital was less than 2 per cent from 1927 to 1933; the industry operated at a loss in 1932.) To prevent a monopoly from forming in the protected business climate, the Import Duties Advisory Committee was appointed as watchdog.

• After World War II, steel was earmarked for state ownership by the Labor government elected in 1945.

The industry's postwar problems were greatly multiplied by the prospect of nationalization. The Nationalization Bill was given royal assent in 1949, but wasn't effected until February, 1951, when shares of nearly 100 of the largest firms were transferred to the Iron & Steel Corp. of Great Britain. Many smaller companies, principally engaged in finishing, remained under private ownership. The split made planning and supervision harder.

• The Conservative government returned to power in 1951 and pledged to return steel to private hands.

In November, 1951, the Iron & Steel Corp. was directed to make no further change in the industry. In 1953, the Iron and Steel Act, designed to reorganize steel under private ownership, yet continuing public supervision, was passed. The Iron & Steel Corp. was abolished and ownership transferred to the Iron & Steel Holding & Realization Agency, charged with returning the companies to private ownership. A new Iron & Steel Board was given supervision of the industry.

• The present organization, based on the Iron and Steel Act, provides for both private and public control.

The private element, the boards of directors of the operating units, controls finances, commercial policy, and day to day operations. Ultimate power over industry policy, planning, scale of development, raw material supplies, and prices rests with the public group, the Iron and Steel Board appointed by the minister of power. It reports regularly to the minister, who reports to Parliament.

• Here are the Socialists' charges and some answers:

1. Steel has failed to develop adequately under private ownership.

Conservatives point to "the record." Capacity has risen from 15.7 million tons in 1946 to 27.4 million tons in 1958. Production climbed from 14.2 million tons in 1946 to

24.3 million tons in 1957, then fell to 22 million tons during the recession last year. Exports of steel and steel goods made up 54 per cent of the value of exports in 1958 compared with 31 per cent before World War II. Conservatives claim exploration and development of raw materials has been carried on at full clip.

Capitalists emphasize that expansion plans were formulated before nationalization in 1951. They say the Iron & Steel Corp. added little fresh thinking in its nine months in power. They add that output achieved under the first two postwar development plans have regularly exceeded the targets. Today, partly due to the recession, excess capacity is well over 5 million tons. A permanent large excess would be a waste of Britain's limited investment resources, they claim.

2. The present method of public control is ineffective.

The Labor Party states: "Ownership and control must be in the same hands if planning is to be effective. Full public ownership is the only way out. Only the state can provide the great volume of capital for building an expanding steel industry at reasonable cost while insuring that the supply of steel matches demand in the right quantities at the right time and that demand is planned to meet the supply."

Conservatives counter that divided control is a merit, for there is fallibility in single judgment. The present arrangement, they say, has the initiative and drive of private enterprise with the public interest safeguarded by a statutory group.

Again they point to "the record": Since 1954, when denationalization began, steel prices have risen but 30 per cent. Coal is up 41 per cent; transport used in steelmaking up 47 per cent. There has been no major industrial dispute. Labor - management relations are harmonious. Earnings of steelmen are among the highest in British history. The plant accident rate has dropped over a third in the last three years.

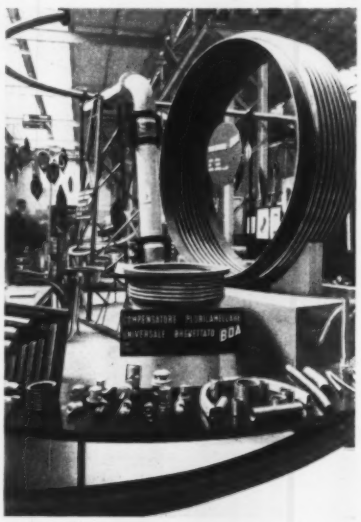
3. Denationalization has failed because much of the capital in industry is publicly owned and shareholders reap the benefits. Control by shareholders is a "mockery."

Those for private interprise say that denationalization has resulted in a wide diffusion of ownership. In fact, 9 out of 10 shareholders in the 12 largest companies own less than 500 shares. All but 12 of the nation's steel firms are in private hands. The only mockery in shareholding are the charges against it, declare Conservatives. Directors must report at least once a year to the shareholders which is a more definable responsibility than "public interest."

• So the basic issue seems to boil down to the old socialism-capitalism quarrel.

Probably the best argument against nationalized steel is the poor record of Britain's publicly owned enterprises. Most are sick. The coal industry, the railroads and other public transport facilities run by the British Transportation Commission, British Overseas Airways, and British European Airways have all piled up huge deficits. Gas and electricity are the only government owned industries to show a profit over the years. Labor troubles, especially in coal and transportation, are worse than ever.

Some inside sources believe those expecting steel's nationalization will have a long wait.



METALLIC BELLOWS and bellows assemblies, made by Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn., are displayed at the industrial controls exhibition of the Milan Fair, Milan, Italy

Butler, Morton Urge: Get into Politics

ARE BUSINESSMEN as active in politics as they should be?

"No," say Paul M. Butler, chairman of the Democratic National Committee, and Sen. Thruston B. Morton (R., Ky.) chairman of the Republican National Committee.

• **Blast**—Speaking at an American Management Association meeting in New York, Mr. Butler accused many businessmen of being "woefully ignorant when it comes to politics and public affairs, of scorning personal participation in politics, dodging direct responsibility, and identifying themselves with the axiom that what is good for the corporation is good for the nation."

Senator Morton agrees that managers should be interested in broad problems but also believes they "should be articulate and aggressive" in helping to shape the policies and programs that affect business directly.

• **Sauce for the Goose**—Both chairmen cautioned that managers should enter the political arena as citizens, not as representatives of corporations. Says Mr. Butler: "Corporations don't have the right to adopt positions on political issues as corporations unless they take a vote of their stockholders beforehand, and even then there's some doubt about the legality of using corporate funds for political activity."

STEEL asked Chairman Butler if the same restriction ought not to hold equally true for a labor union. He wouldn't give a direct answer but intimated that unions have more freedom of action than corporations in this sphere. But Senator Morton said he doesn't think unions have any right to spend funds in support of a political candidate even though it has become practice.

In the 1958 elections, says the senator, 32 labor groups reported political expenditures coming to $1,828,777. Only $13,850 went to Republicans even though more than 25 per cent of the union vote went

to them. He looks for labor to step up its activities next year.

• **Evaluation** — Management has been on a par with labor in presenting its case to elected legislators, says the senator. But it hasn't been as aggressive in supporting "sympathetic" political candidates or in telling its story to the public.

Ike Enters Turbine Fight

President's cabinet considers plea of electrical manufacturers to halt federal buying of imported turbines. Canadians will be among foreign builders supplying latest U.S. projects

FROM the Office of Civil & Defense Mobilization to the President's cabinet—that's the route the case of the imported turbines has taken in the last two weeks.

Months ago OCDM reportedly had its conclusions ready on the appeal for help by General Electric Co. and the National Electrical Manufacturers Association. Their contention: Imported turbines endanger national security. But behind the scenes, struggles between trade and protectionist forces have frustrated action by the President; his cabinet finally met last Friday to discuss OCDM's recommendations and the White House's position.

The problem hasn't been static during OCDM's deliberations. U. S. firms bid $15 million for a job at Wamapum, Wash., and $9 million for a job at Big Bend, S. Dak. Dominion Engineering of Canada bid about $10 million for Wamapum, against Baldwin-Lima-Hamilton and Allis-Chalmers. English Electric, Great Britain, bid $6 million for Big Bend against B-L-H.

• **Made in Canada**—What astonishes the U. S. producers most: The Big Bend contract (eight, 90,000 kw turbines) will be handled by a Canadian subsidiary of English Electric, while the Wamapum project is for ten hydroturbines, also to be built in Canada. U. S. companies contend Canadian wage rates won't allow for the underbidding of the foreign firms. They conclude those overseas bids are loss leaders, designed to sew up the market.

Wamapum was a free-for-all among foreign competitors, a Washington source says, indicating more foreign firms than ever are becoming interested in the U. S. market. Among the bidders: Hitatchi (Japan), Neupic (France), Nohab (Sweden), and Boving and English Electric (Great Britain).

If U. S. firms had received the two jobs, they would have obtained what for the last ten years has amounted to an average year's sales in the hydroturbine business—about $27 million.

• **TVA Bids Postponed**—To gain more time to prepare bids for $50 million worth of turbines for the Tennessee Valley Authority (STEEL, May 11, p. 102), domestic producers secured a postponement of the bid opening until June 16. Bids were due originally by May 26. TVA has invited three domestic and three foreign firms for that work: GE, Westinghouse, Allis-Chalmers, Brown Boveri (Switzerland), and C. A. Parsons and English Electric. There's talk that English Electric would again turn over some of its work to its Canadian subsidiary, if it won the contract. Before those bids come up, however, the air may be cleared a little.

Tour Russia: $5

You can tour the Soviet steel industry for only $5. The American Iron & Steel Institute will guide you across Russia in a new book, *Steel in the Soviet Union.*

Last spring, 19 American iron ore and steel executives took a month's good will trip through the USSR. They visited iron mining, benefication, sintering, blast furnace, steelmaking, and rolling mill operations. The group saw the best Soviet plants and concluded they were well-managed, modern, and efficient. The book is compiled from individual reports made by members of the delegation, led by Edward L. Ryerson, Inland Steel Co., Chicago. STEEL's editor-in-chief, Irwin H. Such, was in the group.

Each segment of the industry is summarized. Other topics include how the industry is managed, a view of Russia from a visitor's experience, and a listing of U. S. and Russian personnel.

Gearmakers Report Fast Comeback

STEADILY increasing bookings for gears provide an index of the rapid recovery of metalworking from the 1958 recession.

Incoming orders reported by members of the American Gear Manufacturers Association are running above the average for 1956, the industry's best year to date.

April bookings were 255 per cent of the 1947-49 average. May orders will be well above April's, judging from reports by AGMA members attending the annual meeting in Hot Springs, Va., last week. Inquiries indicate June will continue the upward trend.

• **Broad Improvement**—An analysis of orders indicates the recovery is fairly even from all gear users. Demand from the capital goods industries is just beginning to show substantial improvement. Orders from makers of heavy duty transmissions for earth moving equipment and large trucks are outstanding.

Chief worry of the gearmakers apparently is that prices are still too low to permit good profits.

New officers of AGMA are: President, J. L. Buehler, Indiana Gear Works Inc., Indianapolis; vice president-products division, J. F. Murray, Winsmith Inc., Springville, N. Y.; vice president-technical division, F. Richardz, Westinghouse Electric Corp., Pittsburgh; treasurer, C. F. Bannan, Western Gear Corp., Lynwood, Calif. John C. Sears continues as executive director.

RELIABILITY

Why SPS Emphasizes It

THIS mountain climber's life hangs by a "thread." That thread, and the fasteners that hold it (insert), must be reliable.

Maybe your sales life hangs by a thread. If the product you make has 100 parts, and each part will function perfectly 99 times out of 100, your product will probably fail six times out of ten.

That's the law of probability. It governs getting "heads" when you toss a coin or a "seven" when you roll dice. Such mathematics are proving an important sales tool for Standard Pressed Steel Co., Jenkintown, Pa., a major producer of threaded fasteners.

But it takes more than statistics to sell reliability. It requires modern quality control methods, a clear understanding of customer needs, and up-to-date research and engineering facilities, plus modern, efficient equipment and well-designed production and testing methods. H. Thomas Hallowell Jr., SPS president, calls reliability a "way of life."

• SPS's philosophy is being translated into rising sales of higher quality fasteners.

Example: Prosperity Co. Inc., Syracuse, N. Y., paid two maintenance men time-and-a-half rates for 3 hours every Saturday to cinch down fasteners on the firm's presses. (Severe shocks and vibration constantly loosened them.) Seeking greater reliability, the firm switched to Unbrako self-locking cap screws at critical press points. Now, fasteners on the 1000 ton press have to be tightened only once every five months.

That's just one of hundreds of applications in which SPS customers have switched to better fasteners to get greater reliability. SPS's 1959 sales could exceed $80 million (vs. $64.7 million last year). It had a 5 per cent sales gain last year—despite the fact that it sells heavily to the machinery industries, where the recession was most severe.

• You have to educate the buyer.

Many purchasing agents and design engineers specify factors that insure extremely high reliability for the main components of an assembly. Then they buy cheap, small parts to hold down the total cost. What they fail to consider is that failure of a small part causes breakdowns too. A penny saved may be a failure earned.

SPS is teaching its customers' purchasing agents the reliability formula. It wants them to intelligently evaluate the cost (in dollars—or tenths of a cent) and savings (in future sales, customer good will, time, and headaches) of a high reliability rating. Example: An additional finish grind, adding 1.3 cents to the price of a fastener, triples its fatigue life. SPS is helping venders to justify increased initial cost to get better product performance.

• SPS's reliability campaign is based on experience.

The firm has fought long and hard against letting the pressure of price prostitute performance (it preached "product quality" during 1954's outbreak of price fighting).

SPS began telling its sales story in "reliability" terms about 18 months ago. It emphasizes reliability in its marketing because of facts like these:

1. The nation's repair and servicing bill will exceed $17 billion this year.

2. The missile program is at a stage where many experts accept

only a 50-50 chance of success as typical of the state of the art.

3. Auto fatalities, often due to mechanical problems, are on the rise.

4. Factory downtime costs are skyrocketing. It costs you about $15 an hour for a turret lathe, $15 to $40 an hour for hot or cold headers, around $75 an hour for a high speed, semiautomated sheet steel press line, and several hundred dollars an hour for some large automated lines.

5. Today's more complex machines—from industrial equipment to household appliances—have more parts. So each part must be more reliable to maintain the same end-product reliability. For example, if you make an item with 250 parts, it's 77.85 per cent reliable if each part is 99.9 per cent reliable. Add ten components and you must boost the reliability of each of the 260 parts to 99.9038 to maintain your old reliability rating of 77.85 per cent.

The Atlas ICBM is said to have 300,000 components. To put that missile on target nine times out of ten, each part must have a reliability rating of 99.99996 per cent.

A product with 500 parts, each with a 99 per cent reliability rating, has only a 1 per cent chance of doing its job perfectly. Imagine what that means in a giant luxury airliner that has 2½ million parts.

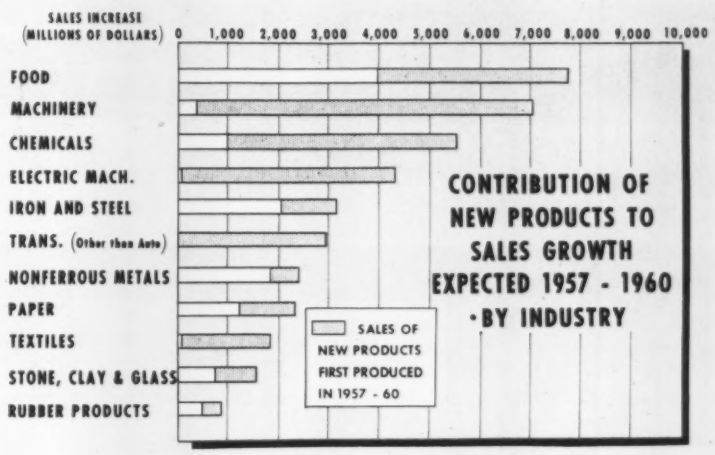
6. Today's tougher competition demands stronger marketing. One method: Boost product quality and emphasize that in your advertising and selling.

• SPS believes the trend to buying brand names in the quest for high reliability will increase.

It contends: "Less and less will the business go to the unproven, though lowest priced, producer. Customers will . . . seek out the proven performer, even if he may occasionally sell at a slightly higher, though still competitive, price."

The company has developed a booklet and a motion picture to convey the reliability story. Both are available on request. An eastern missile contractor asked for 500 copies of the booklet to distribute to lab personnel. A major producer of consumer goods got a copy of the film for its library.

New Products Are Key To Future Growth



Source: Booz, Allen & Hamilton.

IMAGINE the year is 1909. You're the manager of one of the country's leading firms and must help chart its future. You project your thinking 50 years and see that two out or three of the leading companies of your day are no longer in business. In fact, you find that the majority of the 100 largest companies in 1959 attained their positions within the preceding 25 years.

• More Change Ahead—The exercise has a moral for modern metalworking managers. Comparing the last 50 years with the next 50, the rate of change in product prominence and demand will look like a Thunderbird alongside a Model T. Only companies that have aggressive, well planned new product programs will be able to keep up with the competitive pace.

"The company that relaxes because of the sales and profits of today could find itself with warehouses full of Hula Hoops or Davy Crockett hats tomorrow," warns the Association of Consulting Management Engineers Inc., New York.

Over the next five years, studies show new products are expected to contribute 30 to 80 per cent of business volume. One way to keep up, says ACME, is to weed out dead products and grow new ones—by diversifying, by concentrating on broadening product appeal, by defining markets more clearly or expanding their boundaries.

• Bumpy Road — At least 80 per cent of all new products fail, and the odds are climbing as competitive pressures become stronger.

ACME believes many of the duds and misfires are due to: Lack of coordination, especially between marketing and engineering; failure of production-oriented top executives to measure the marketing needs of the product against the resources of the company; changed economic conditions or public tastes; poor executive judgment on the size or nature of the market; internal management rivalries and jealousies; and too many intuitive decisions.

• The Approach — How can you plan for new products?

Executives at Profit Counselors

Inc., New York, suggest the first step is to develop a blueprint of what you want to do, or in the words of the president, Robert King, a product policy. For example, what is your marketing and manufacturing position? What's your basic reason for seeking new products? It could be to level out peaks and valleys of a production item, obsolescence of a product, age of a patent, or the desire to diversify.

Next, define what your product development program will do. Chances are you'll come up with: 1. Development of new products. 2. Improvement of present ones. 3. Elimination of uneconomical or outmoded items.

Organization of your program is the next step. Pinpoint responsibilities, pick a staff, set up a chain of command, develop lines of communication. Lastly, decide how much you're going to spend—set up a budget but don't be so rigid you can't beef up funds if an item looks "hot."

Once you have set up the machinery, development of the product falls into six basic steps:

• **Exploration**—Search for ideas to meet company product objectives. They may come from your research department, salesmen, or customers. You might advertise for new product ideas or answer advertisements in newspapers and magazines. Most companies have more new product ideas than they know what to do with, says C. Wilson Randle, partner in Booz, Allen & Hamilton, Chicago. "The world is lousy with ideas, and it's also lousy with lousy ideas. The problem is picking out products that will pay off most and quickest."

• **Screening**—Weigh in the technological, market, and other factors to determine a prospective product's interest to a company. The consensus is that the product should be related to those you already produce. Pay more attention to a product that falls into present marketing outlets rather than one that fits current production equipment and schedules. Profit Counselors' Donald Hoodes suggests that often a company doesn't evaluate its key advantage—its present market. His advice: Pick a product that complements your product line. Your reputation in a market can often be what's needed to give your new product that added chance of survival.

• **Specification**—Analyze the idea and establish a workable plan.

• **Development** — Turn the plan into a workable and producible product.

• **Testing**—Do product and market tests to confirm earlier judgments.

• **Commercialization** — Launch the product in full-scale production and distribution.

• **Example** — Federal Pacific Electric Co., Newark, N. J., has had a much higher than average success in marketing new products. Its formula: "We analyze sales trends for present products to discover what markets are expanding. Then we analyze our customers to discover which groups are growing—we concentrate on filling their needs. Finally, we analyze our profit margin trends. New products usually need high margins, at least initially."

Market research than comes in to pinpoint industries that would use the product, looks for applications, estimates sales patterns and the total market, analyzes competitive items, gives a general idea of how profitable it would be to expand the line.

Sales angles are considered: How will salesmen and distributors feel about the product? Will it bolster volume or cut into sales of present products? Will it help sell the firm's related equipment? Can it be moved through present channels of distribution.

Financial factors are studied. Can the company afford research and

New Products...the Group Approach

The committee approach is becoming increasingly popular in new product development. At Rockwell Mfg. Co., Pittsburgh, new product ideas are screened by this group, headed by Board Chairman W. F. Rockwell Jr. It includes the vice president of engineering and research, executive vice president, controller, vice president of the Meter & Valve Div., vice president in charge of Delta power tool sales, vice president in charge of the power tool division, president of Edward Valves Inc. (a subsidiary), and the manager of market research. An active search for new profitmakers, such as the radial saw (see model at far end of table), has won Rockwell substantial new markets (it's now the second largest maker of radial saws) and boosted sales by 35 per cent in six years (1952-58).

development costs? To stay with and promote the product until it wins acceptance? To carry it at an initial loss, if necessary? How long will it take for competitors to enter the market? How much capital will be needed for manufacturing and stocking at varying levels?

Finally, FPE asks these questions: Can we price the product competitively and get back our investment within a reasonable time? Would another product yield a faster profit?

• **Price Right**—Once you've built that better mousetrap and have the machinery to get it to the customer's door, don't jeopardize the operation by setting an unrealistic price.

Says Leo M. Beckwith, president of Market Forge Co., Everett, Mass.: "You don't necessarily reap a larger profit just by asking a higher price. It may just tend to encourage competition. The price you command depends on the relative superiority and novelty of the product rather than cost."

His advice: Set a price that will gain the fastest acceptance of the product, that will yield a regular rate of return, and that is as low as good design and sound profit planning permit.

• **Who Should Be in Charge**—Successful programs are headed up by a person or group charged with the responsibility to develop new products. Most companies take one of two approaches: They invest responsibility in a new product manager (more popular with smaller firms), or a product development committee (the trend in larger companies).

Photostat Corp. recently shifted from the committee to a new product planning manager. His responsibilities: 1. To help create today's corporate image—he looks for improvements in products and for items that can be quickly developed for the current market. 2. To develop a corporate image for up to five years in the future—he looks for products which require a longer period to develop and which meet projected market needs. He reports directly to the president.

Air Reduction Sales Co., New York, takes the committee approach —a product sales manager, development engineer, manager of marketing, production manager, and manager of development. On its own initiative it can authorize reasonable expenditures on a project.

If the project is of major importance and crosses divisional lines, it makes the recommendation to the R&D steering committee, composed of top corporate management.

When the new product group screens an item it spells out such things as applications, what it should sell for, what sales are expected, life of product, and estimated cost of development. After approval by top management, the project is set up; engineers are assigned; and a prototype model developed. Next, field trial units are manufactured, tested, and changes are made. Then the product is transferred to manufacturing.

During all the preparatory stages, members of the group formalize advertising and sales programs. Marketing is analyzed as a first step in development. By the time the factory gets the finished drawing, everything is ready for shipment to the consumer.

• **Cost** — No set formula governs how much you should set aside for new product development. Air Reduction spends from a few thousand dollars to more than $1 million, depending on the product. At Federal Pacific, 2 to 3 per cent of net sales go into development. Air Reduction's expenditures last year for both research and development were about 3.5 per cent of gross sales.

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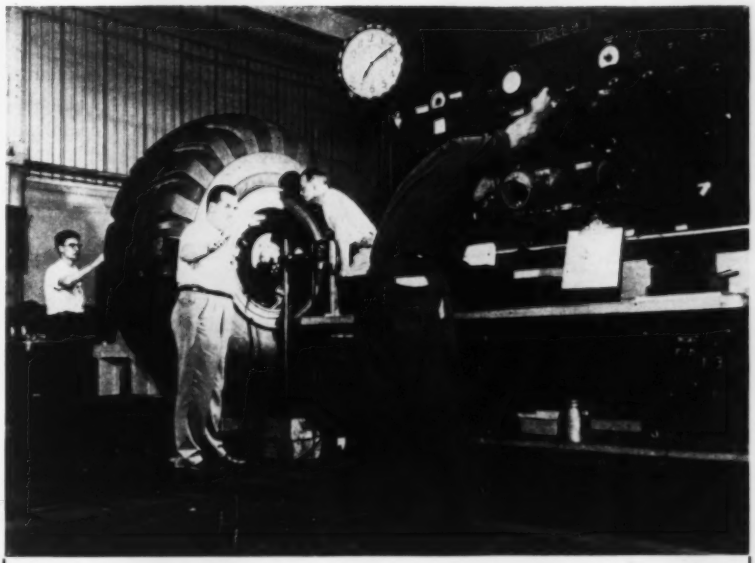

New Products Need Testing

They must be exhaustively checked from both the engineering and marketing standpoints. Lack of adequate tests is probably the greatest single reason for product failure. Here, a motorized wheel, designed for earth movers in pit mining and heavy construction industries, is being put through its paces at General Electric Co.'s Locomotive & Car Equipment Dept., Erie, Pa. An electric traction motor is an integral part of the wheel, eliminating transmissions, axles, and gearshafts.

House Ponders Defense Cuts

AN UNPRECEDENTED move is underway in this age of missiles. It looks as if Congress will slice about $400 million from President Eisenhower's defense budget for fiscal 1960. Why? "There is something wrong in our present military planning," says the House Appropriations Committee, which recommended the cut. Bickering, confusion, and duplication are charges hurled against the Pentagon.

Here's how the budget looks as changed by the committee: Army, $9.2 billion (an increase of $222 million); Navy, $11 billion (a decrease of $83 million); Air Force, $17.2 billion (a whopping cut of $539 million). Compared with fiscal 1959's budget, the Army will pick up $155 million, the Navy will lose $455 million, while the Air Force is asked to absorb an astonishing cut of $754 million.

Plusses and minuses by specific procurement programs: The Army gets $200 million more for its modernization program and the Nike Zeus missile. The Navy gets $255 million more for its antisubmarine efforts. The Air Force will have $172 million more for the Atlas and Minuteman.

It's easy to see the direction of the committee's thinking by comparing plusses and minuses. The plusses are forward looking projects, calculated to make this country's defense posture stronger in the next five years. The minuses tend to be programs already obsoleted by advanced technology. Thus the Navy loses $260 million it wanted for its conventionally powered "super" aircraft carrier. The Air Force won't get $128 million for its Mace, a modernized Matador, or $163 million for the Bomarc.

Congress Has Taken a Second Look

Involved in the budget cut is a second look by some penny pinching congressmen, as well as the refusal by many others to take the Pentagon's (especially the Air Force's) word as gospel when it comes to planning expenditures.

Outlook: Congress will keep a much tighter rein on future defense spending than many observers expected. Of course, the Senate must O.K. the cuts too, but circumstances favor the penny pinchers. It will be tough for at least two Presidential candidates in the Senate to come out for duplicating missile programs, no matter what expert knowledge in defense matters they are supposed to have.

A Switch in Stock Option Taxes?

Sen. William Proxmire (D., Wis.) has introduced a bill to cut the top personal income tax rate from 91 to 65 per cent. The comments of this liberal perhaps indicate a tendency of Congress to encourage tax cuts where the revenue loss to the Treasury Department is small. It's too early to spot a trend, but maybe corporations can look for a break from the liberals too, despite rumors this week that Democratic leaders will ask for a two year extension of the 52 per cent corporate tax rate. The strategy would be to avoid a fight next election year.

Senator Proxmire calls the upper bracket rates "confiscatory," and says they tend to "discourage initiative." He does have a gimmick, though, in advocating tax cuts: He wants stock options taxed as ordinary income, instead of as capital gains. That provision would cut into the remuneration of many middle managers as well as the top corporate executives.

Strauss Fights for Confirmation

Inside the Commerce Department, conservative civil servants are talking about the tremendous battle Adm. Lewis Strauss is putting up to be confirmed as secretary of commerce. Others in his place might leave the in-fighting to aides or the White House. Instead, the former Atomic Energy Commission chairman is calling on members of both houses of Congress, by telephone and personal visit, to solicit their support.

His troubles were doubled last week when newspapers ran a report that he would appoint a railroadman to run the Commerce Department's study of the nation's transportation problems (air, rail, highway, waterway, pipeline, and ocean). He denied the report, however, pointing out that a Columbia University professor has been managing the study since February.

Capitol Notes

Metalworking should keep an eye on the 12 nation conference on Antarctica scheduled for Oct. 15: Conference results may indicate how the resources of that continent may eventually be tapped . . . The Budget Bureau firmly opposes establishing a Department of Science on the Cabinet level . . . 67 trade associations have been invited to attend the U. S. Chamber of Commerce meeting on depreciation, June 11, in Washington . . . Dave McDonald, USW president, predicts: No labor reform bill this year . . . Russia is reported to have sought cold rolled sheets from U. S. steelmakers a few months ago for auto production, but the industry turned thumbs down.

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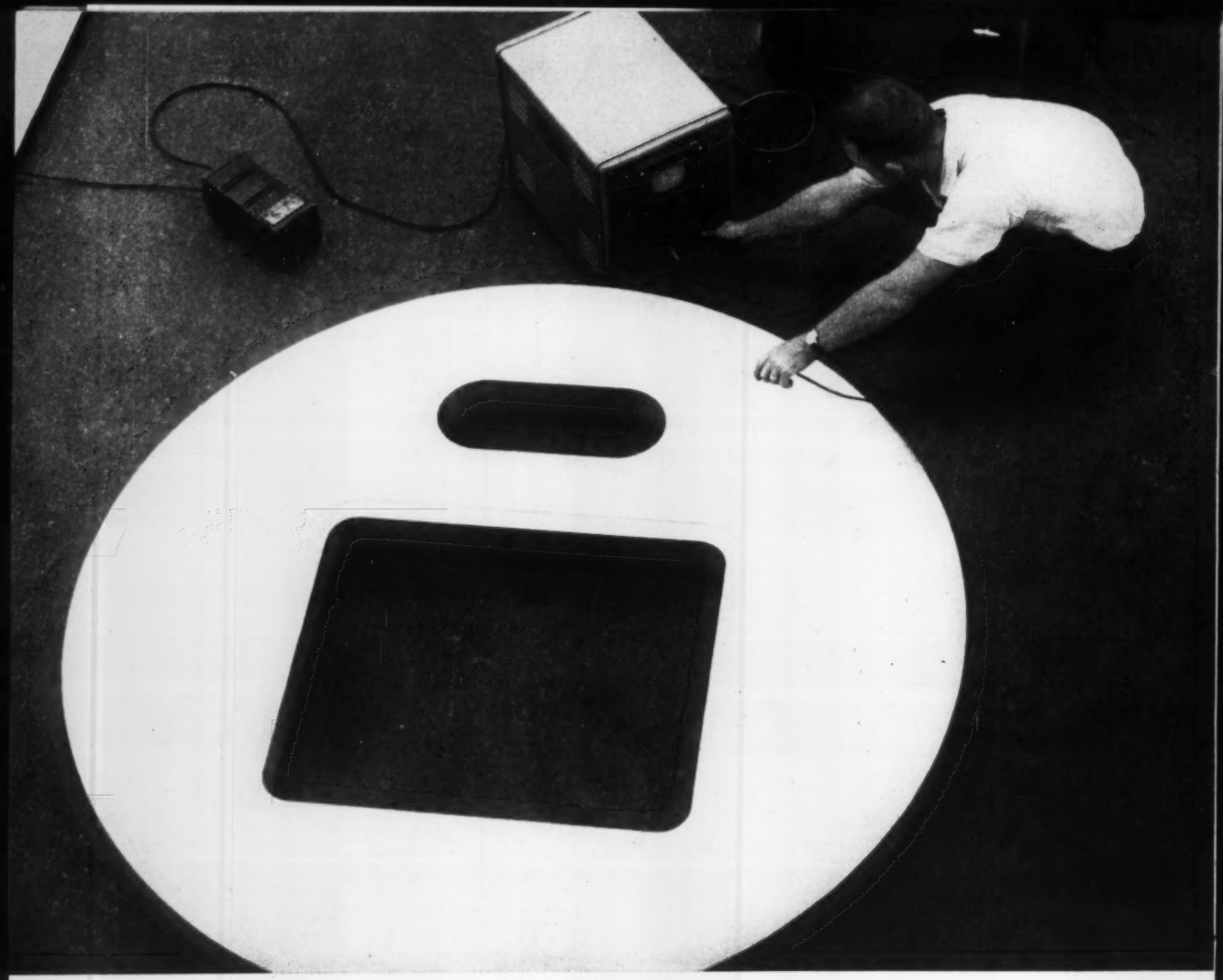

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Aluminum Foam Opens New Industry

PRODUCTION TONNAGE of foamed aluminum, while not yet impressive, is generating a lively interest in the year-old product. One producer reports sales in the first quarter topped total sales in 1958.

"Usage in the plastic tooling and patternmaking fields is growing quite rapidly, even though it was not known six months ago," says Jack R. Kreigh, president of Foamalum Corp., LaSalle, Ill. "We feel there will be uses for the product in the marine, aircraft, missile, automotive, and construction fields."

Producers see construction potential for the metal in panels, core material for doors, acoustical ceiling tile, and store fronts. Marine uses might include docks and piers, surfboards, fish net floats and boat parts. The aircraft industry might adapt it for surface parts, electronics and radio housings, and furniture.

"Obviously, our biggest market could be in the construction field, which we hope to enter this year with the introduction of 4 by 8 ft panels in various thicknesses. These foamed panels would be light, easily sawed in the field, warpproof, rotproof, and verminproof. They would not require paint, and termites would find them highly indigestible," he adds.

• The foamed aluminum industry consists of two known plants.

Foamalum Corp. and Dynamic Metals Corp., Houston, are the only known commercial producers of the material, both operating on licenses from Bjorksten Research Laboratories Inc., Madison, Wis. The research company, which developed and patented the process for foaming aluminum, zinc, magnesium, copper, and steel, recently sold its patent rights to the newly organized LOR Corp., Enid, Okla.

Johan Bjorksten, whose firm is continuing its development work, feels that large tonnage applications are on the way for foamed metals, both in the mechanical and building trades. He says that promise is greatest "where high rigidity in relation to weight is advantageous, or where the extreme energy absorbing properties on shock are important."

Foamed aluminum is formed chemically at Foamalum Corp., LaSalle, Ill.

Foamalum is now merging with LOR Corp. to develop and produce all five foamed metals. More research is needed in the working of steel, although it has been foamed successfully.

• A chemical mixed with molten aluminum produces the metal foam.

The chemical leavens the mixture, causing it to rise in the mold. The amount of rise, controlled by the amount of chemical, temperature, and mixing action, produces a foam ranging from one-seventeenth to one-third the weight of solid aluminum.

Intricate castings have been made with foam; in some, density has been reduced to 12 lb per cu ft. Panel castings have been made as large as 4 ft square, 6 in. thick, and weighing 135 lb.

Foamed aluminum is normally produced from the various alloys rather than pure aluminum; physical properties vary with the alloy used. Tensile and compressive strength are nearly proportional to the weight of the foam compared with the weight of the ingot metal. Rigidity and malleability are both termed "good." The material may be machined, cut with a bandsaw, nailed, bolted, glued, screwed into, and bent or pressed into shape with little or no splintering or shattering.

• Magnesium-aluminum alloys are said to foam best.

Recent tests showed a 7 per cent magnesium-aluminum alloy, formed into a sheet of 1.3 in. thickness with a 36 lb per cu ft density and skin surface on each side, to have an average tensile strength of 17,400 psi. The material had an average yield strength of 15,500 psi. Compression strengths varied between samples of different sizes and bubble structure, but ranged from 2000 to 8000 psi.

Producers feel that demand for foamed metals will grow wherever weight is important in selecting a metal. Because foamed aluminum will float, they predict new applications in the marine as well as aircraft industries.

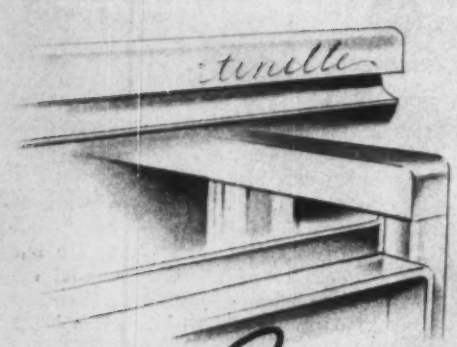
Prices for foamed aluminum vary from $1 to $2.25 a pound, depending on the size and complexity of the casting order, as well as the alloy specifications.

Forms Micro-Ball Division

Berthelsen Engineering Works Inc., Joliet, Ill., has organized a division (called Micro-Ball) for the manufacture of chrome steel balls. Robert Surerus is general manager.

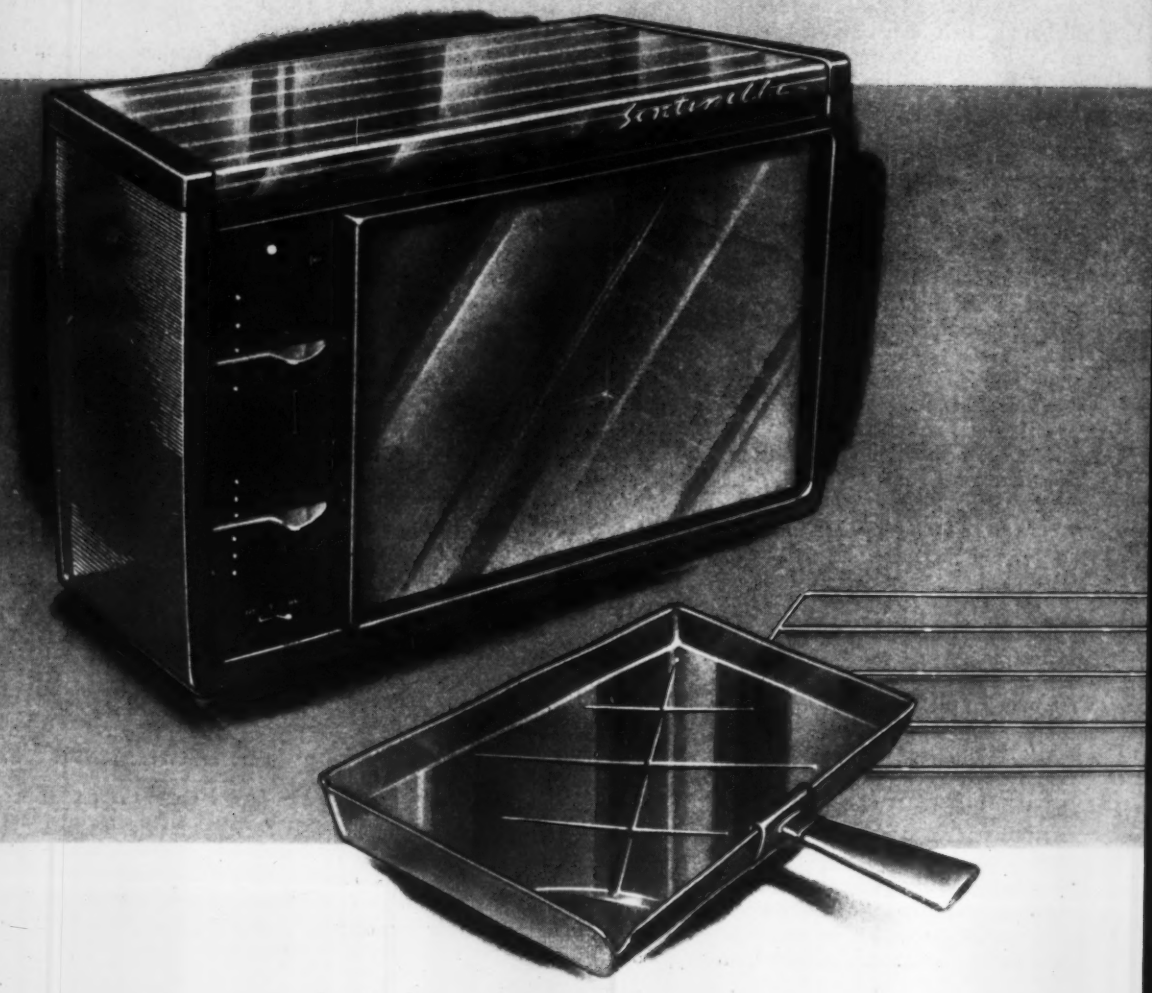
Will Build Copper Smelter

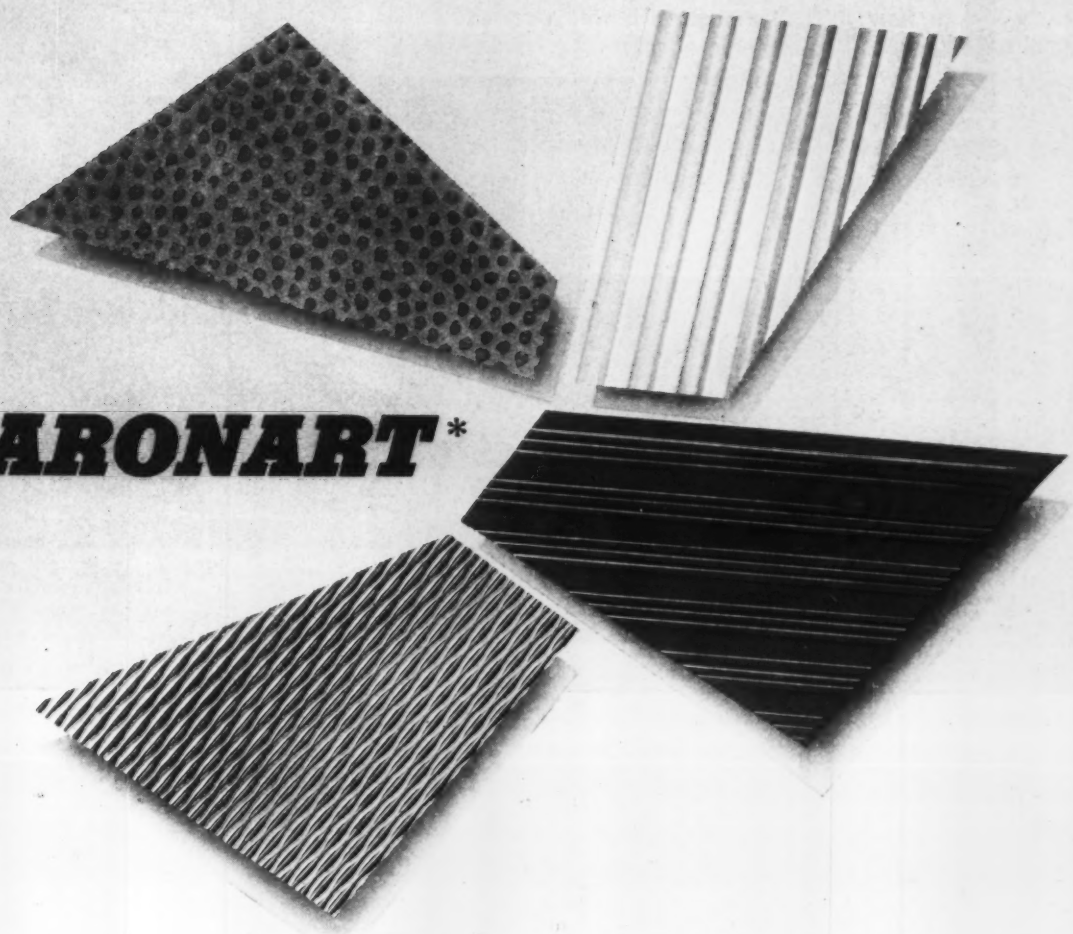
Bethlehem Copper Corp., Victoria, B. C., plans to build a $40 million copper smelter 150 miles northeast of Vancouver, B. C. The project will include open-pit mining facilities, a smelter, concentrator, and a town site.



One of America's best known and most successful designers, Russel Wright, is practically a household word to Mrs. America. He, more than any other one man, has brought practical design to the average American housewife. Mr. Wright believes "good design" should be universal and his general aim is to create the widest variety of products for the widest possible market at the lowest possible cost so that "good design" can reach everyone.

Russel Wright designs with.





..SHARONART*

The portable broiler is high on the list of appliances most wanted by the modern American housewife. Until recently, little attention was paid to its design. The unwieldy bulk and lackluster styling of most models contrasted with the functional beauty of today's colorful kitchens and kitchen tools.

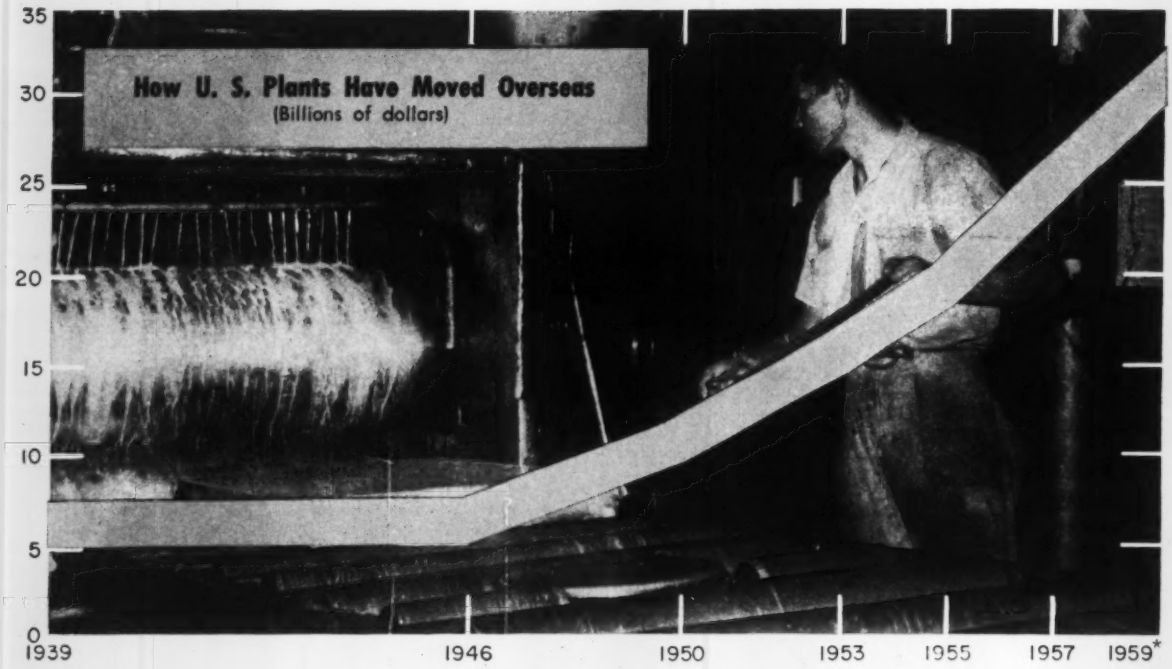
Russel Wright, world famed designer, has applied his talents to this appliance and has created a broiler with the attractive tailored look designed to harmonize with modern day kitchens.

In place of the outmoded polished chromium cover, Mr. Wright has utilized Sharon Steel's exciting new Sharonart* stainless in combination with a main shell of colored baked enamel over textured Sharonart*. Russel Wright has replaced impractical broiler operation with simple, functional, press-down levers that automatically set the thermostat and timer, and has included a stainless steel well-and-tree tray designed to be carried to the dining table and generous bakelite handles for safe carrying of the unit.

Whether you make broilers—or any other appliance—it's certain Sharonart* will give your product the same fresh look Russel Wright has achieved in this broiler design. *The Sharon Steel Corporation, Sharon, Pa.*

*T. M.

SHARONSTEEL **SHARON** *Quality* **STEEL**



*Estimated by STEEL.
Note: Figures refer to direct, long term, private investments (cumulative).
Source: Departments of Commerce and State.

More U. S. Industry Moves Abroad

MORE AND MORE metalworking executives are boarding jet planes to hop from continent to continent.

No wonder, says Henry Kearns, assistant secretary of commerce for international affairs: Since the 1920s, there has been a significant shift in the form of private, long term investments abroad — from portfolio investment which implies no important implication in management decisions, to direct investment where ownership of more than 25 per cent of the business is usually involved.

• **How to Do It**—Here are the ways to invest dollars directly overseas: 1. Wholly owned subsidiary. 2. Majority ownership in a business. 3. Equal ownership with foreigners. 4. Minority ownership. 5. Investment on a contract basis with a fixed procedure for retiring the U. S. investor's interest. (That sort of investment of U. S. dollars totaled $25.3 billion in 1957. Direct investments have more than doubled since 1950.)

• **Most Keep Expanding**—Furthermore, a Department of Commerce survey reveals that well over 75 per cent of those U. S. firms overseas now plan to increase their activities significantly by the end of 1960. New opportunities for investment can be learned from such government sources as the Bureau of Foreign Commerce, the International Co-operation Administration, and the commercial attaches of our embassies abroad.

The State Department has recommended a system of government-industry teams surveying underdeveloped countries for investment opportunities. Firms most seriously interested maintain Washington offices for daily contact with representatives of all governments.

• **Where?** Here's an evaluation of the direction of private capital flow abroad by Benjamin Javits, brother of Sen. Jacob Javits (R., N. Y.), and author of a plan to create a World Development Corp. to promote overseas investment. Mr. Javits notes most U. S. investments in Canada and Latin America are private, whereas public funds account for half of our investment in Western Europe. Little private money gets into Asia. He contends "a vast expansion of private investment is imperative" in the less developed parts of the world.

If you are interested in establishing manufacturing facilities overseas, note Mr. Javits' thought that Western Europe may be getting too big a share of the private funds going into manufacturing. Only about 20 per cent of the private money going into Latin America is for manufacturing, for example. Almost 60 per cent of the private funds in the underdeveloped countries is in petroleum. "This contributes less than manufacturing to

their upbuilding," he says.

• **How Much?**—Private capital that went abroad in 1928 amounted to only 1.3 per cent of gross national product, he says. It dropped to less than 1 per cent in 1957. Mr. Javits believes $13 billion a year of private money should be flowing overseas from the U. S.

Mr. Kearns contends: "Private investment abroad puts money into our customers' pockets." U. S. exports from 1953 to 1957 increased 59 per cent; direct investments abroad in manufacturing increased 52 per cent. Comparison of those increases, he says, constitutes "strong evidence of the close and beneficial relationship between investment and trade." Three specific examples of the relationship: Manufacturing investments in the United Kingdom jumped 122 per cent, while trade rose 116 per cent. In the Union of South Africa, investment increased 145 per cent, trade 136 per cent. In India, investment was up 125 per cent, trade 103 per cent.

• **Why Go Overseas?**—One of the more obvious benefits to U. S. firms going abroad is cheaper labor. Of 625,000 persons employed by U. S. companies in Latin America, only 9000 are U. S. citizens. The usual procedure is to provide technicians to train local workers.

Commerce says the most frequent reason for building a plant abroad is to fight the loss of established foreign markets through the inability of customers to send money out of the country. Indeed, currency and tariff restrictions sometimes force a U. S. manufacturer to come into a country and assume a share of the tax burden.

Other good reasons for moving overseas: Proximity to markets means lower transportation costs, as does proximity to raw materials.

• **Taxes, Taxes**—The U. S. firm seeking a fair return on its foreign subsidiary runs into tax problems no matter where it goes.

In the Western Hemisphere, your host country may grab 75 per cent of your taxable income (Uruguay), or as little as 13 per cent (Nicaragua).

In Europe, France will take almost 54 per cent, Greece 35 per cent.

If you're thinking about Asian investments, remember that Burma wants about 70 per cent of your taxable income, but the Philippines only 41 per cent.

In the Middle East, Israel levies 63 per cent; Iran 16 per cent.

The least developed area of the world (and reckoned the hottest for Communist-Western economic warfare in the next 25 years by many experts) is Africa. Nigeria gets 45 per cent of your taxable income; Morocco, 20 per cent.

(All tax rates exclude inducements offered by some countries for new industry.)

The effective total tax you'll pay on a foreign subsidiary, including U. S. taxes, can run from about 45 per cent of earnings to 75 per cent. Those rates may soon be changed: Rep. Hale Boggs (D., La.) has submitted a bill to Congress calling for extensive revisions in our taxing structure (H.R. 5). The lowest rate would become about 34 per cent under the bill, but subsidiaries in countries where the local tax is above 52 per cent (the U. S. corporate tax rate) would not benefit.

• **Other Problems**—If you become interested in overseas investment, check out these potential sources of trouble before you leap, suggests the Trade Relations Council (formerly the American Tariff League): Political instability of some foreign nations, the difficult to analyze problems of any nonnational operating a business in a foreign community, and the chance of being thrown out or expropriated.

The National Industrial Conference Board surveyed U. S. firms operating abroad in 1957 and came up with these trouble spots: Unfavorable currency exchange rates, unfair competition in the form of government owned or subsidized industry, discriminatory tax decisions, and difficulty in importing materials.

Oh, yes, and that old bugaboo: Cartels.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*

What Regions Are They Settling in?

(Average annual increase in value of direct private investments)

(Millions of dollars)	1946-50	1950-53	1953-55	1955-57
Canada	280	550	620	920
Latin America	430	430	290	1100
Western Europe	170	220	310	500
Other	260	300	290	450

Note: About two-thirds of the value increase represents new investments and one-third is via reinvestment of earnings in the 1955-57 period. From 1950 to 1955, about 50 per cent of the increase was in new investments; 50 per cent in reinvestments.
Source: Departments of Commerce and State.

What Industries Are Going Abroad?

(Percentage distribution of direct private investments in 1957)

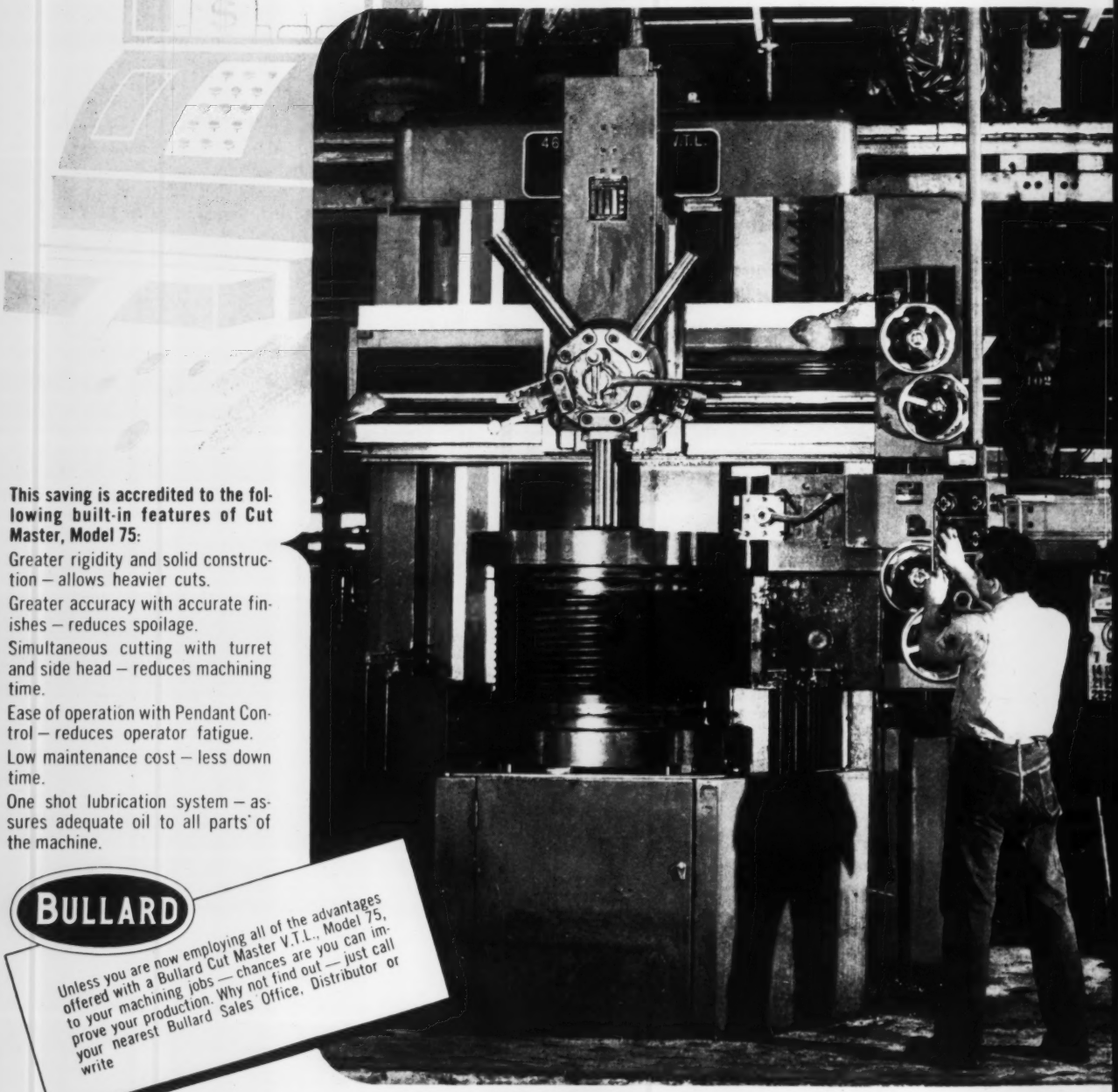
Petroleum	36	Public utilities	7
Manufacturing	31	Distribution	6
Mining	11	Other	9

Source: Departments of Commerce and State.

It Pays To Replace

An analysis of cost records at Philadelphia Gear Corporation, Philadelphia, Pa., shows, according to Mr. John Walker, Shop Foreman,

"A savings of up to 30% in overall production over our older 42" Bullard V.T.L. with our 46" Cut Master V.T.L., Model 75."



This saving is accredited to the following built-in features of Cut Master, Model 75:

Greater rigidity and solid construction – allows heavier cuts.

Greater accuracy with accurate finishes – reduces spoilage.

Simultaneous cutting with turret and side head – reduces machining time.

Ease of operation with Pendant Control – reduces operator fatigue.

Low maintenance cost – less down time.

One shot lubrication system – assures adequate oil to all parts of the machine.

BULLARD

Unless you are now employing all of the advantages offered with a Bullard Cut Master V.T.L., Model 75, to your machining jobs — chances are you can improve your production. Why not find out — just call your nearest Bullard Sales Office, Distributor or write

4,000 pound Drum for gate hoist which is bored, faced and turned on 46" Bullard Cut Master V.T.L., Model 75.

THE BULLARD COMPANY BRIDGEPORT 9, CONN.

New Plating Method Revives Chrome

Auto designers, who like bright finish, may return to the metal for some trim. The Duplex process reportedly ups its rust resistance 500 times over conventional plating

A NEW PLATING PROCESS may make rust pitted bumpers and taillight housings passe. The Duplex method, developed by Metal & Thermit Corp., Rahway, N. J., is said to increase corrosion resistance 500 times over conventionally plated parts. That means savings to carbuilders through reduced warranty costs. Zinc diecasters and other makers of plated parts hail it as a breakthrough which again makes them competitive with aluminum for such items as grilles and headlamp bezels. Automakers switched to the lighter metal for corrosion resistance as much as for weight reduction.

GM's Ternsted Div. is one of several auto suppliers already turning out Duplex plated parts. Some Cadillac bumper parts are Duplex chromed. Next year, Pontiac will have a line. Delco-Remy Div. and Brown-Lipe-Chapin Div. are expected to use it. Chevrolet will be Duplexing bumpers in its Livonia, Mich., plant.

Ford Motor Co. has changed its plating specifications to include M&T's process for next year's cars. The Dearborn, Mich., carbuilder will have lines in its Monroe, Mich., and Sandusky, Ohio, plants. Chrysler Corp.'s suppliers will be using it for many parts on its cars (see STEEL, Apr. 20, p. 65).

H. D. McLeese, M&T's vice president, says the process basically consists of two coats of chrome, each with special characteristics. Only a single coat is needed for some parts. Both coatings are used in areas where corrosion is most prevalent. Copper and nickel undercoatings remain unchanged. Mr. McLeese believes undercoating thickness can be reduced in many nonautomotive applications.

• **Unhappy History** — Motordom's past experience with chrome plated parts has not been happy. Designers liked the bright finish, but coatings would corrode quickly. Applying a thicker chrome flashing caused surface cracks that also produced rust spots. Bumpers and tail lamp housings often showed rust by the time cars arrived in dealer showrooms, boosting warranty costs.

Warranty costs can hurt. Chrysler sources say the thickness of chrome was increased on Imperial bumpers last year. Despite a cost penalty of $3 a car, the lack of customer and dealer complaints saved Chrysler $5 a car on warranty claims. Facing such a cost picture, Detroit moved to aluminum for many parts, though weight wasn't a prime factor. Stylists didn't like its duller finish, but the lack of quick corrosion meant sizable savings on replacement parts. Platers continued to work on coatings that would last longer.

• **Why Parts Rust** — Here's why corrosion occurs in plated parts: 1. The chrome bath won't throw off enough material to fill all the recesses in the surface of a zinc casting or steel part. 2. It's too thick and cracks. Moisture trapped in these crevices sets up an electrolytic current between dissimilar metals like chrome and nickel and copper undercoatings. The current strips away the metal and causes deeper pinholes and blisters. Rust results when it eats through to bare steel. Once a spot develops, the current concentrates in that area and the process goes just so much faster. Road salts speed up the action tremendously.

In 1953, M&T developed a crack-

RIDING ON AIR is no dream in Ford Motor Co.'s Levacar Mach 1. It travels a fraction of an inch above the highway. Sitting inside the car is Dr. Andrew A. Kucher, Ford's engineering and research vice president, who proposed an air propelled vehicle 30 years ago. George W. Walker (standing) styled the aluminum Levacar. It's on display at the Ford Rotunda, Dearborn, Mich.

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free chromium plating bath (CF 500) that permitted thicker flashings without cracks. Although it increased corrosion resistance, it required costly buffing to bring out the bright finish car designers wanted for trim. The company improved its crack-free bath (CF 520) to reduce buffing. But parts that were exposed to road salts still corroded quickly.

• **Duplex Developed** — Metal & Thermit then discovered a coating of crack-free chrome covered by another coat with a controlled crack pattern (CR 110) would drastically reduce corrosion. Dr. Edgar J. Seyb Jr., research supervisor of M&T's Detroit laboratory, explains: "When finely cracked chromium is deposited on crack-free chromium, the many cracks disperse the (electrolytic) cell action over a larger area. A substantial reduction of current density occurs at each of the individual openings." Result: Not enough current is built up in any given spot to strip off the metals. Corrosion is virtually stopped.

• **Slows Corrosion** — Using CASS or Corrodkote tests (one cycle or 16 hours equals a year in service), a steel grille section with ordinary chrome plating shows 10 to 25 per cent surface corrosion (ASTM No. 2) after the equivalent of three years' use. With the Duplex coating, the same part showed less than 0.1 per cent corrosion (ASTM No. 9) after the equivalent of 20 years' use.

A conventionally plated, zinc diecast door handle was given a rating of seven after 16 hours. Using Duplex coatings, the rating rose to nine after 32 hours. A rating of eight generally is considered the minimum acceptable standard for production quality control purposes, says Dr. Seyb.

One automotive source tells STEEL that a slight subsurface haze appears when both coatings are used, but adds that the industry no longer feels this is unacceptable because they've become used to the slightly duller aluminum finishes. M&T's method still doesn't prevent chrome from cracking under stress at points where parts are fastened together, but Mr. McLeese says that even here corrosion resistance is improved.

• **Costs Comparable**—Although the process costs a bit more (zinc people figure about 1 cent a pound more on castings), its ultimate advantages outweigh the initial penalty.

When in-plant benefits such as less buffing and immediate replating of rejects are taken into account, finished costs often can equal those of ordinary chrome plating.

Equipment changes are fairly simple. Duplexing requires between 15 and 20 per cent more tank area. Rectifiers sometimes have to be changed to provide more current for the process. Total plating time is increased about 5 minutes when both coatings are used.

Chrysler Tightens Up

Chrysler Corp. has established a three division sales group and a corporate sales staff to bolster its marketing structure.

Biggest change is to combine Plymouth and De Soto as a single division. Other divisions are Chrysler-Imperial and Dodge Car & Truck.

E. C. Quinn will be vice president and general manager of the sales group. Each division will have direct responsibility for distribution, product planning, advertising, promotion, market analysis, scheduling, and dealer relations for its lines. Chrysler already has announced that its small car, Valiant, will be separate from the Plymouth line. Observers expect Valiant sales will come under Mr. Quinn's control.

Vice President J. B. Wagstaff, former De Soto chief, will head the corporate sales staff. He'll be responsible for sales and service training, government and fleet sales, and MoPar Div. marketing.

The change gives individual divisions more responsibility over distribution and field sales, although engineering and manufacturing responsibilities are still under corporate group control. The move is interesting because it's a slight reversal from centralized management, which appears to be a growing trend among carbuilders. Reason: Need for reduced administrative and manufacturing costs. Results are appearing in centralized engineering staffs and in standardization of body and chassis components for various lines within the companies.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,500†	349,613
5 Mo. Totals	2,725,651†	1,904,902
June		337,446
July		321,017
August		180,447
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
May 2	118,059	78,434
May 9	134,763	78,506
May 16	135,856	87,407
May 23	133,568	86,082
May 30	117,470†	66,844
June 6	120,000*	73,696

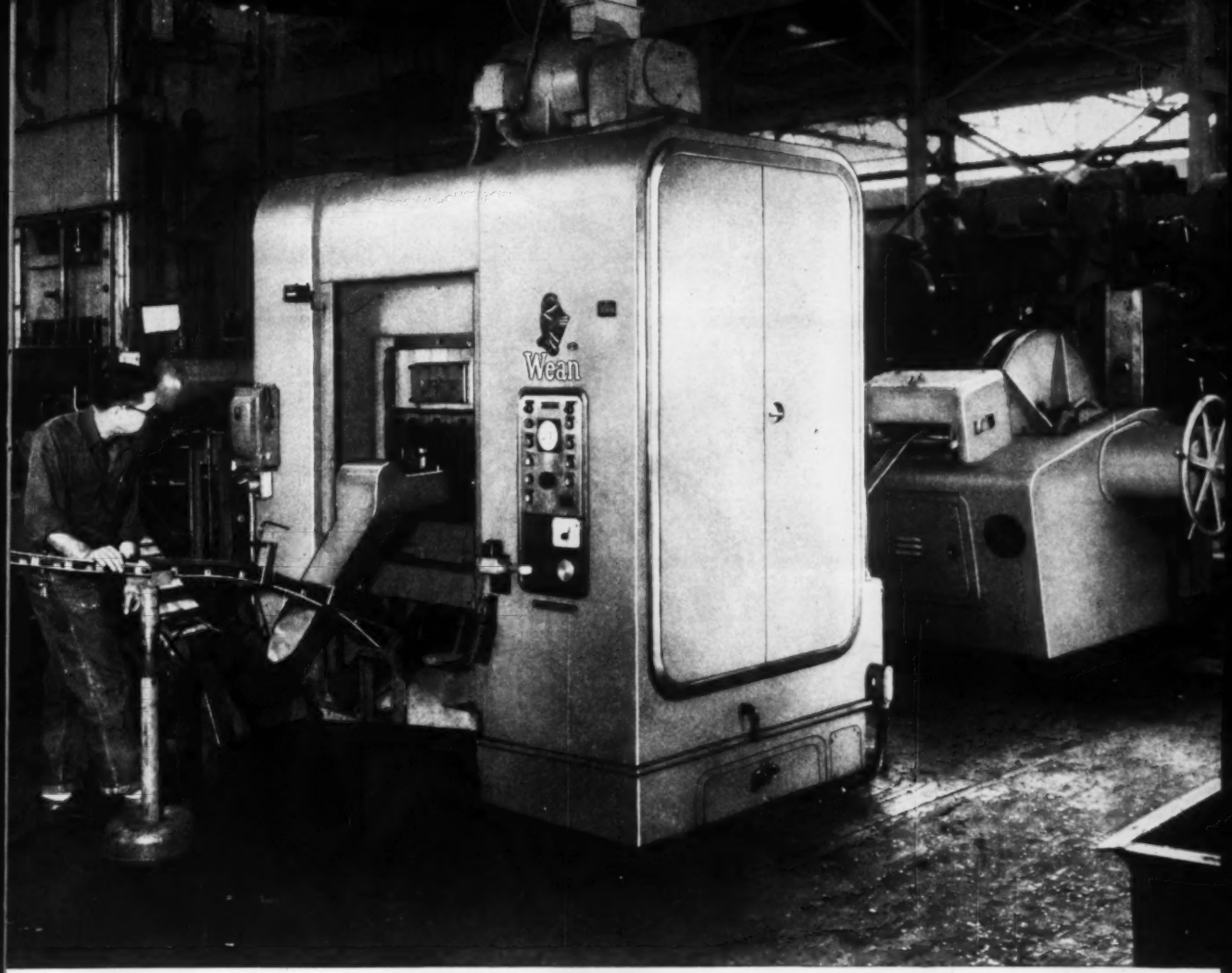
Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Ford Stock Deal Opposed

Ford Motor Co.'s plan to increase its stock holdings in the firm's Canadian subsidiary, Ford Motor Co. of Canada, seems to be meeting some contrariness from Canadian Prime Minister Diefenbaker's office. Absentee ownership of Canadian industry by U. S. firms has been strongly opposed.

Ford has offered a 30 per cent premium for Class A and B stock in an effort to boost its holdings from 27.5 to 75 per cent. This would amount to a $150 million investment if the deal goes through. Although the subsidiary's management favors it, there's been enough talk among government officials and Canadian businessmen to indicate that many stockholders won't offer their stock for sale. Ford may have trouble collecting shares it wants.

The Dearborn, Mich., carbuilder's move is one of many in the industry to strenghten each firm's hold on world markets by exercising stronger control over subsidiary operations (see STEEL, May 4, p. 55). The Canadian firm says Ford will build its small Falcon across the border, but the parent company refuses to comment on this announcement. Ford of Canada sold 26,177 cars in the first quarter vs. 20,575 in the first three months of 1958.



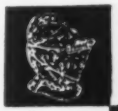
At major automotive plant:

One Wean "Flying Press" replaces two conventional presses

This manufacturer used to produce transmission vanes on two conventional presses. Using seven-stage dies, these machines delivered the formed vanes at a combined rate of 308 parts per minute.

One specially designed Wean "Flying Press" now turns out the same part at 350 SPM, freeing the conventional presses for other work and reducing to one set the expensive dies needed. In addition, a tailor-made nest stacker now makes handling of the vanes a simple task. The firm estimates savings in operation and maintenance costs at upwards of 50%: a valuable bonus to increased production.

Many modern manufacturers have realized similar cost savings through use of the Wean "Flying Press" concept when quantity production, versatility and a high degree of press utilization are required. Won't you write for more information, or for a personal visit from a Wean sales representative? We are certain that he can help you find important potential savings in your production processes, too.



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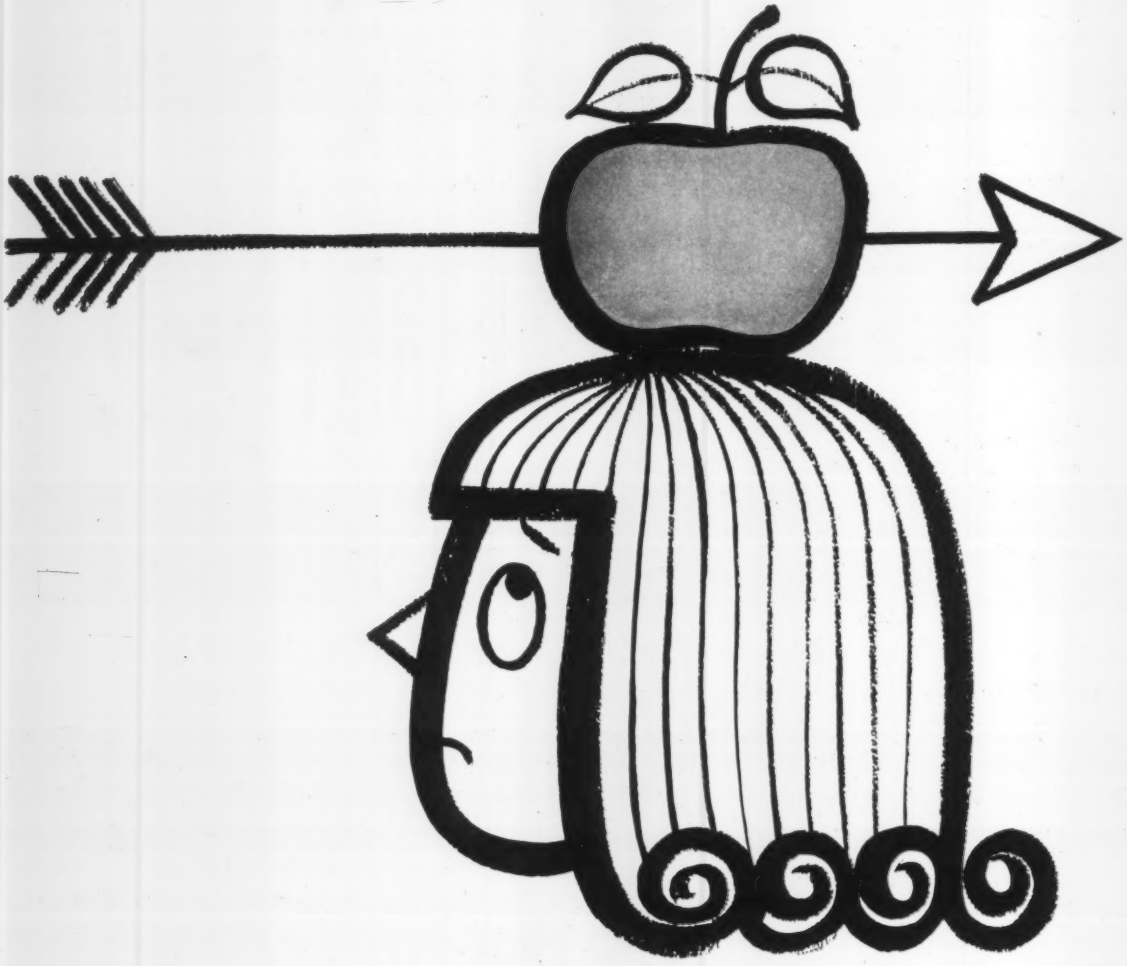

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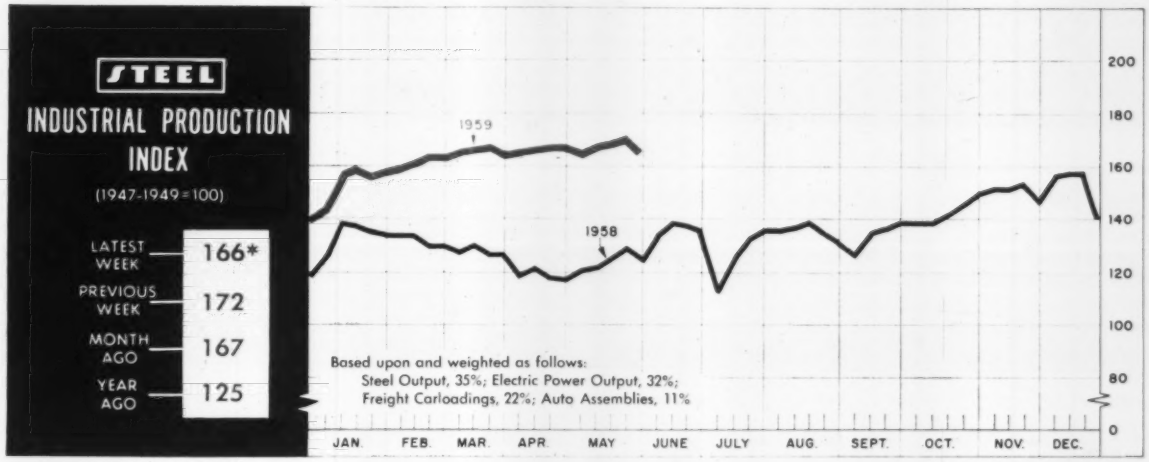

*Week ended May 30.

Summer Business Outlook Brightens

SUMMER BUSINESS is shaping up more solidly than most businessmen anticipated as recently as March. If there is no steel strike, it looks like many operations will go right through the summer with no letdown except for vacations. If there is a steel strike of any significant proportions, it will put a damper on the third quarter, but the stage will be set for one of the biggest comebacks of any fourth quarter on record.

• **What Purchasers Say**—One of the brightest forecasts since the upturn started over a year ago comes from the National Association of Purchasing Agents. In its May business survey, it asked its panel about prospects in the third quarter. Nearly half—42 per cent—think it will be better than the second quarter, which in some ways is the best on record. Another 29 per cent think it will be about the same. And an overwhelming 85 per cent say it will be better than the third period of 1958.

Looking farther ahead, the purchasers feel that the last half will be better than the first (58 per cent) and that it will be better than the corresponding period of last year (85 per cent).

"There is no doubt that business, as of now, is good," the association reports. "All our criteria point to near-boom conditions." Not since the Korean War have so many members (60 per cent) reported a monthly increase in production as they did from April to May. Over half indicated an increase in new orders. More members told of employment gains than at any time since 1951.

Not so cheerful is the report on prices. Buyers say that pressures for higher prices are getting more difficult to contain. Thirty per cent reported increases in materials they bought last month.

Indicative of the strong production trend is the fact that the PAs have not been able to build inven-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,674[1]	2,650	1,685
Electric Power Distributed (million kw-hr)	12,500[1]	12,931	11,316
Bituminous Coal Output (1,000 tons)	8,360[1]	8,185	7,270
Crude Oil Production (daily avg—1,000 bbl)	7,175[1]	7,216	6,256
Construction Volume (*ENR*—millions)	$679.1	$468.2	$588.1
Auto, Truck Output, U. S., Canada (*Ward's*)	150,819[1]	169,551	92,254
TRADE			
Freight Carloadings (1,000 Cars)	640[1]	686	571
Business Failures (Dun & Bradstreet)	259	311	337
Currency in Circulation (millions)[3]	$31,473	$31,515	$30,813
Dept. Store Sales (changes from year ago)[3]	+9%	+9%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,544	$26,546	$21,129
Federal Gross Debt (billions)	$285.8	$285.3	$275.4
Bond Volume, NYSE (millions)	$26.4	$26.1	$20.8
Stocks Sales, NYSE (thousands of shares)	14,873	15,970	9,298
Loans and Investments (billions)[4]	$94.9	$95.4	$91.8
U. S. Govt. Obligations Held (billions)[4]	$29.0	$29.7	$30.9
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	222.0	221.7	195.5
All Commodities[7]	119.5	119.6	119.3
Commodities Other than Farm & Foods[7]	127.8	128.0	125.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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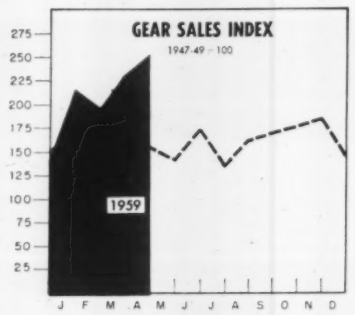
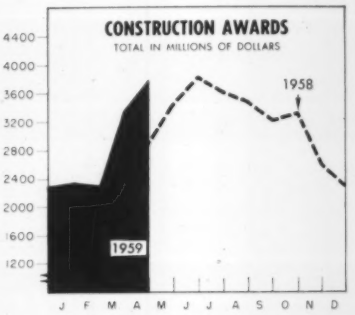
MEN OF INDUSTRY





	1959	1958	1957	1956
Jan.	218.6	174.5	259.3	245.5
Feb.	199.9	179.1	239.5	256.2
Mar.	234.3	173.7	262.4	276.5
Apr.	255.6	153.2	221.7	264.7
May	....	142.2	263.2	275.6
June	....	173 8	215.9	245.4
July	....	133.3	211.4	286.7
Aug.	....	162.1	225.8	219.5
Sept.	....	170.7	174.9	230.5
Oct.	....	175.9	207.0	299.8
Nov.	....	182.7	165.3	216 2
Dec.	....	145.5	150.8	235.7
Avg	....	163.9	216.4	254.4

American Gear Mfrs. Assn.

	Total		Building	
	1959	1958	1959	1958
Jan.	2,319.2	2,060.0	1,839.7	1,530.2
Feb.	2,307.0	1,953.4	1,777.4	1,478.1
Mar.	3,339.9	2,721.2	2,453.9	2,037.7
Apr.	3,778.4	2,881.0	3,018.0	2,198.0
May	.....	3 402.6	.....	2,470.3
June	.....	3 819.6	.....	2,340.3
July	.....	3,607.1	.....	2,633.5
Aug.	.....	3,466 6	.....	2,529.5
Sept.	.....	3.215.9	.....	2,352.5
Oct.	.....	3 309.0	.....	2,549.8
Nov.	.....	2.593.9	.....	1,980.8
Dec.	.....	2,281.9	.....	1,728.6
Totals	.....	35,312.2	.....	25,829.3

F. W. Dodge Corp.

Charts copyright, 1959, STEEL.

tories as fast as they had expected. Late deliveries from suppliers and a greater rate of consumption have held inventories at the month-ago levels for 50 per cent of the respondents (see Page 59).

• **What Backlogs Show**—Backlogs have been rising since November and generally are at the highest level since late 1957. Latest government figures place the ratio of unfilled orders to shipments for durable goods industries at 3.3 to 1. By midyear, the ratio should be even higher, putting industries in a good position to meet the usual summer slump.

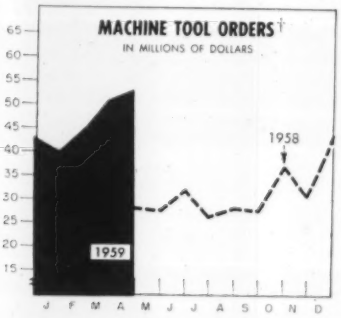
Fabricators of structural steel chalked up the third consecutive rise in their backlogs in April, says the American Institute of Steel Construction Inc. Shipments of 294,806 tons were the highest since October, 1958, but they still ran behind bookings of 294,806 tons. Only once last year (in usually strong July) did bookings top that figure.

The resurging gear industry also reports a favorable balance between orders and shipments. Shipments in April reached a 19 month high, but orders gained a 24 month high (see graph and table above). The backlog index of the American Gear Manufacturers Association has risen nearly 13 per cent since January. (For more on gears, see Page 63.)

New business for members of the Resistance Welder Manufacturers' Association has been coming in at a rate of $2.5 million a month so far in 1959, while shipments have been at a monthly rate of only about $2 million. Result: Unfilled orders are at $7.5 million.

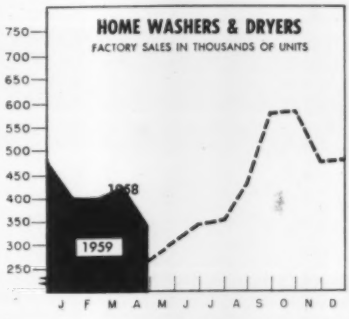
• **What Indexes Indicate** — The rapid rise in most business indexes leads many economists to believe that the momentum will carry right through the summer. The Federal Reserve Board's production index, at a record 149 (1947-49=100) in April, is expected to advance another notch or two in May and June. By midyear, it may be at about 153. Even if a steel strike were to last through July, economists do not think the over-all index would fall more than 3 or 4 points.

The reaction of STEEL's index (Page 81) to the Memorial Day holiday indicates this basic strength in industry. It dropped only 3.5 per cent to a preliminary 166 (1947-49=100) for the week ended May 30 after setting an all-time high of 172 the previous week. In recent times, only in 1958 (near the depth



	New Orders 1959	New Orders 1958	Shipments 1959	Shipments 1958
Jan.	41,050	26,850	31,300	57,800
Feb.	45 400	28,300	36,050	48,050
Mar.	51,550	36,150	45,750	54,150
Apr.	53,450*	28,300	45,100*	50,900
May	.....	28,050	.....	50,100
June	.....	32,100	.....	45,500
July	.....	26,550	.....	29,700
Aug.	.....	28,300	.....	29,800
Sept.	.....	28,100	.....	34,900
Oct.	.....	37,000	.....	41 400
Nov.	.....	30,700	.....	33 650
Dec.	.....	43,900	.....	43,950
Totals	.....	374,300	.....	519,900

†Metal cutting and metal forming.
*Preliminary.
National Machine Tool Builders' Assn.



	Washers 1959	Washers 1958	Dryers 1959	Dryers 1958
Jan.	288,491	244,840	118,220	100,793
Feb.	297,826	268 143	106,274	79,683
Mar.	329,668	287,884	98,434	71,523
Apr.	274,372	224 896	67,752	38,475
May	.....	262,999	.....	41,898
June	.....	288,831	.....	54,173
July	.....	277,287	.....	75,513
Aug.	.....	326,785	.....	109,833
Sept.	.....	423,073	.....	158,733
Oct.	.....	404 056	.....	180,405
Nov.	.....	333 035	.....	142,499
Dec.	.....	330,520	.....	148,670
Totals	.....	3,672,349	.....	1,202,198

American Home Laundry Mfrs. Assn.

of the recession) and 1953 (just on the brink of the 1953-54 slide) was the holiday dip less.

Contractors Set New Mark

Helped along by one of the best weeks of all time, construction contractors racked up the biggest May on record, says *Engineering News-Record*, totaling nearly $2 billion of new business. This brings the cumulative total for the first five months of the year to $8.5 billion, 10 per cent ahead of the corresponding period of 1958.

The total of $679.1 million in heavy construction awards for the week ended May 28 is the second highest on record. Private awards were the largest since 1956.

But the most encouraging aspect of construction news is the comeback being staged by industrial building. Through April, this category is 39 per cent ahead of the corresponding 1958 total, the largest gain except for waterworks and "unclassified."

Philadelphians See Pickup

Manufacturers in the Philadelphia area have done a complete about-face on their capital spending plans since last fall. In a special survey of the Lehigh and Delaware Valleys, the Federal Reserve Bank of Philadelphia finds that business executives now plan to spend $460 million for capital improvements this year, an increase of 11 per cent over the 1958 pace. Six months ago, they anticipated spending no more than $369 million, or a decrease of 11 per cent from the 1958 level.

The change in plans is across the board. Of the 17 industry groups measured, 15 plan definitely higher totals than in the fall. Among durable goods, producers of nonelectrical machinery made the biggest change, followed closely by transportation equipment and electrical machinery.

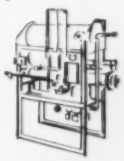
Looking into 1960, 24 per cent of the respondents envision greater capital spending than in 1959, 21 per cent see less, and the balance see no change.

Other important findings of the survey: Manufacturers estimate they will operate at 77 per cent of their capacity in this quarter, followed by 75 per cent in each of the two remaining quarters of 1959. They expect a continuation of the pickup in employment, with slightly higher totals in the fourth quarter than in the year-ago period.

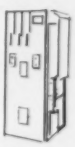
WILLIAM C. DIMAN, Atmosphere Equipment Specialist, reports . . .

MODERN METALS DEMAND MODERN ATMOSPHERES

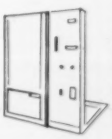
Ever since 1927, when Hayes perfected the first controlled-atmosphere furnace, we have made a steady effort to further the technology of protective atmosphere heat treating. By recommending proper atmosphere equipment, we have helped customers increase production, obtain uniform product quality, and save processing time and trouble. Today, our atmosphere generator line, probably the most comprehensive in the business, includes:



Exothermic Generators . . . for oxidizing or medium-reducing type atmospheres. Standard sizes from 200 CFH to 50,000 CFH.



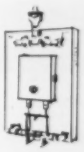
Endothermic Generators — for reducing and carbon potential atmospheres. Standard sizes from 100 CFH to 20,000 CFH.



Ammonia Dissociators — for producing hydrogen-nitrogen atmospheres of high purity and low dew point. Standard sizes to 5,000 CFH, or multiples thereof.

Nitrogen Generators — for 99.99% pure inert gas at less than 20¢ per 1000 cu. ft. Standard sizes from 1,000 CFH to 10,000 CFH.

Forming Gas Generators — for producing controlled ratios of nitrogen and hydrogen from dissociated ammonia. Standard sizes 500 CFH, 1,000 CFH, and larger upon request.



Molecu-Dryer (with LINDE'S Molecular Sieves) — for drying, sweetening, purifying protective atmospheres down to dew points of minus 100° F. Standard sizes from 250 CFH to 6,000 CFH and larger on request.

Hayes offers more than just equipment. Our engineering organization and experimental lab are ready to help make sure you get a "Results Guaranteed" solution to your heat treating or protective atmosphere problem. Write for descriptive bulletins.

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It pays to see HAYES for metallurgical guidance, laboratory facilities, furnaces, atmosphere generators, gas and fluid dryers.

Another Tinnerman Savings Story...

Easier, faster, better, cheaper...4 reasons to use **SPEED GRIP**® Nut Retainers

Easier ... because anyone anywhere on the J. I. Case tractor production line can snap the spring steel retaining legs of the SPEED GRIP into punched panel holes. No special skill required. Hole alignment is no problem – the nut "floats" inside the cage to compensate for normal tolerances in the parts being assembled.

Faster ... no staking, no welding. No retapping of paint-clogged threads because SPEED GRIPS can be applied *after* painting. And they pop quickly and easily into position for final assembly.

Better ... heavy-duty SPEED GRIPS make possible sturdy, reliable attachments because both the cage and the nut are made of high quality steel. In case of accidental cross-threading, the SPEED GRIP can easily be replaced. You never have to "make do" with a sub-strength fastening.

Cheaper ... J. I. Case estimates a savings of about 30% per fastener over the previous method.

Want to achieve these benefits of SPEED NUT Brand Fasteners for your product? Refer to your Sweet's Product Design File, section 7-Ti, then call your Tinnerman representative (listed in most Yellow Pages under "Fasteners"). Or write to:

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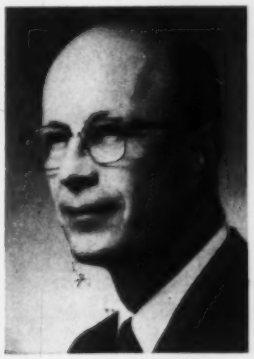
JOHN R. LALLY
C. G. Hussey president

SUMNER B. TWISS
heads Chrysler-Cycleweld

JOHN E. ERSKINE
Racine Hydraulics president



BURRELL H. TRIPP
Taylor & Gaskin president

John R. Lally was elected president of **C. G. Hussey & Co.**, Pittsburgh, division of Copper Range Co. He was vice president and sales director, and is succeeded by **John G. McNeely**, former vice president and director of purchases. **Ralph W. Myers**, former vice president-special products, was elected vice president and director of purchasing.

Sumner B. Twiss was appointed president of Chrysler Corp.'s **Cycleweld Chemical Products Div.**, Trenton, Mich. (formerly Cycleweld Cement Products). He was assistant chief engineer-basic sciences, engaged in research involving materials used in all phases of automobile manufacturing.

Ben Olson was made chief engineer, Components Div., **Victoreen Instrument Co.**, Cleveland. He was with National Union Electric Corp. as director of research and engineering.

Eugene A. Costa was elected vice president, **Detroit Harvester Co.**, Oak Park, Mich. He is also executive vice president and general manager of Weaver Mfg. Co., Springfield, Ill., acquired by Detroit Harvester as a subsidiary in April.

Robert F. Lux was appointed vice president-manufacturing, **Kin Tel Div.**, San Diego, Calif., Cohu Electronics Inc. He was factory manager.

Edgar H. Lalendorf succeeds **Carl R. Meinardi** as president of **Willyard Co.**, Toledo, Ohio.

John E. Erskine was elected president, **Racine Hydraulics & Machinery Inc.**, Racine, Wis., succeeding his father, **Malcolm E. Erskine**, who continues as chairman. **George B. Miller** was named executive vice president. **James E. Mohrhauser** was made vice president-operations.

John W. Daughters was appointed sales manager, **Cincinnati Gilbert Machine Tool Co.**, Cincinnati. He was field engineer.

B. C. Robertson was made general sales manager, **Lone Star Steel Co.**, Dallas. He is succeeded as manager of oil country tubular goods, Houston area, by **Phil Clarke.**

Dr. Arthur G. Metcalfe was named assistant director of research at **Solar Aircraft Co.**, San Diego, Calif., in charge of advanced research projects. **John W. Welty** is assistant director of research, applied research activities.

Dr. Robert W. Gurry joined **Union Steel Corp.**, Union, N. J., in charge of the Research & Development Dept. Dr. Gurry is co-author of *Physical Chemistry of Metals.*

R. P. Schmidt was named manufacturing manager; **H. J. Little**, production superintendent, at **Chrysler Corp.'s** McGraw glass plant, Detroit, expected to start production in January.

Carl J. Maki was elected to the new post of assistant to the executive vice president at **Dresser Industries Inc.**, Dallas. Mr. Maki was with Texaco Inc. (formerly The Texas Co.).

Burrell H. Tripp was elected president, **Taylor & Gaskin Inc.**, Detroit, and of its subsidiary, Indiana Bridge Co. Inc. He succeeds **Mervyn G. Gaskin**, now chairman. Mr. Tripp was executive vice president of Luria Engineering Co.

James D. McKinnon, former Chicago district manager of **Copperweld Steel Co.'s** Aristoloy Steel Div., Warren, Ohio, was named **Detroit** district sales manager to succeed the late **Charles Glenn.**

Merritt D. Hill was elected a vice president of **Ford Motor Co.** He is general manager, Tractor & Implement Div., Birmingham, Mich.

Frank Crook, former Crane Co. executive, was elected executive vice president of **Hettrick Mfg. Co.**, Toledo, Ohio.

Natural Gas Equipment Inc., Pasadena, Calif., appointed **William O. Owen** assistant to the president, and manager of the Industrial Furnace Div.

Malcolm C. Myers fills the new post of manager of product engineering and development for **OPW-Jordan**, Cincinnati. He was west coast district manager.

Theodore R. Anderson was made superintendent of **Wheatland Tube Co.'s** Wheatland, Pa., plant. He succeeds **Frank T. Smith**, who becomes special consultant until retirement later this year.

J. Wayne Lindquist was appointed manager-standard pipe products,

CLYDE M. HORAN

DONALD W. LLOYD

Youngstown Sheet & Tube gen. supts.

C. F. LAUSTEN

ALBERT O. DEGLING

American Can vice presidents

National Tube Div., U. S. Steel Corp., Pittsburgh.

Youngstown Sheet & Tube Co. appointed **Clyde M. Horan** general superintendent-basic steel operations for its Indiana Harbor and South Chicago works; **Donald W. Lloyd,** general superintendent-steel plant rolling and finishing mills, Indiana Harbor Works. **Robert McCafferty** was made superintendent-continuous buttweld tube mills; and **Charles W. White Jr.**, superintendent-bloom, billet, bar and skelp mills, Indiana Harbor. Messrs. Horan and Lloyd will be in newly created posts. In addition, Mr. Horan will supervise the South Chicago Works.

Walter J. Dugan Jr. was made manager-rubber market development, Silicone Products Dept., **General Electric Co.**, Waterford, N. Y. He was sales development manager for the Silicone Products Dept.

Richard W. Claypoole was named manager, railroad products section, **United States Steel Corp.**, Pittsburgh. He succeeds **Samuel McClements Jr.**, retired. **Robert S. Whiteside** succeeds Mr. Claypoole as assistant manager.

Lawrie C. Radway joined **Milwaukee Valve Co.**, Milwaukee, subsidiary of Controls Co. of America, as product engineer to correlate product and tool design. He was project engineer-special machinery, Vapor Blast Mfg. Co.

Eli Mitchell was made west coast regional manager for **Clevite Transistor Products,** division of Clevite Corp. He was with Hughes Aircraft Co.'s Semiconductor Div., Los Angeles.

American Can Co., New York, elected three corporate vice presidents: **C. F. Lausten,** head of the Canco Div.'s Equipment Dept., will be in company-wide charge of research, development, and machinery. **Albert O. Degling,** head of purchasing for Canco, will be in charge of purchasing, traffic, real estate, and general services for the corporation. **E. T. Klassen,** in charge of Canco industrial relations, will handle overall industrial relations policies.

James Vrungos was made manager-industrial marketing, Electronics Div., **Stromberg-Carlson Div.**, Rochester, N. Y., General Dynamics Corp. He was with Electronic Control Systems, Los Angeles, facility of Stromberg-Carlson.

J. I. Case Co., Racine, Wis., elected as vice presidents: **D. A. Beckenbaugh,** sales and manufacturing administrator; **David A. Milligan,** head of the Industrial Div.; **Frank J. Palermo,** in charge of the eight-plant diversified manufacturing operations; **Jack L. Bush,** controller; **Gordon A. McMillan,** director of Canadian operations.

William L. Sammons fills the new post of general sales manager, **B-I-F Industries Inc.**, Providence, R. I. In addition he directs departments concerned with repair parts and export sales. He was assistant to the president.

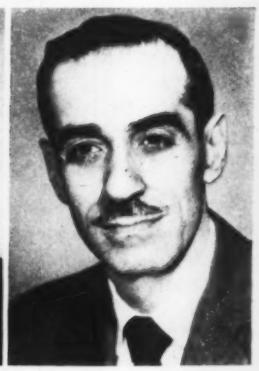
Donald H. Ambrose was appointed foundry superintendent, **Rosedale Foundry & Machine Co.**, Pittsburgh. He was assistant foundry superintendent.

Henry G. Dacey, John Krause Jr., and **Dale W. Patrick** were named assistant vice presidents-sales, Pittsburgh Div., **Screw & Bolt Corp. of America.** Mr. Dacey was general sales manager, Cleveland Cap Screw Co. Mr. Krause was assistant general manager-sales for Screw & Bolt. Mr. Patrick was with the Colona Div., Screw & Bolt.

Thomas H. Armstrong was named vice president - marketing, Data-

D. A. BECKENBAUGH

DAVID A. MILLIGAN



FRANK J. PALERMO

vice presidents of J. I. Case Co.

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You can be sure, when you specify or order from Revere, that you will get not only fine metal but fine service, including Revere's cost-saving Technical Advisory Service if desired. Revere—now an integrated producer of aluminum—can supply you from large modern sheet mills in Baltimore, Md., and Chicago, Ill.

In addition to aluminum coiled and flat sheet, circles and blanks, both plain and embossed, Revere can furnish aluminum seamless drawn, welded and extruded tube; extruded shapes; forgings; foil; and primary aluminum pig and ingot.

It pays to do business with the most dependable sources of supply—such as Revere, which has been fabricating fine non-ferrous metals for more than 150 years.

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up to 48″ wide and up to .125″ thick

Alloys			
1100	3003	5005	5052
1145	3004	5050	5357

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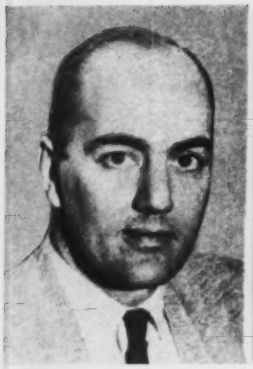
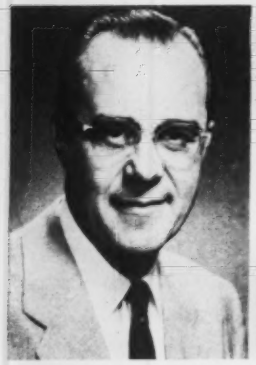


GRIFFIN M. STABLER
Alloy Tube production mgr.

WILLIAM D. MACGEORGE
Tatnall chief engineer

KENNETH E. LEWIS
J&L division post



GEORGE R. BROCKWAY
Vac-U-Lift president

ROBERT R. ASHLEY
Detroit Controls mfg.-mgr.

MALCOLM F. JUDKINS
joins Sylcor

matic Div., Boston, **Minneapolis-Honeywell Regulator Co.**

George R. Brockway was appointed president, **Vac-U-Lift Co.**, Salem, Ill., division of Siegler Corp. He was vice president of Rapids-Standard Co., and executive vice president of Raymond Corp.

George L. Schafstall was made director of purchasing for **Crosley Div.**, Cincinnati, Avco Corp. He succeeds **A. J. Verax**, recently made manager of the Cincinnati plant.

Hans H. Hennecke, vice president-engineering, Food Machinery Div., **Baker Perkins Inc.**, Saginaw, Mich., assumes new full-time duties in a program of product diversification.

Clifford E. Allison was elected vice president-treasurer, **Lewis Welding & Engineering Corp.**, Cleveland. **Edward W. Hollis** was elected vice president-general sales manager.

Robert W. Adams was made manager of wire sales, **Aluminum Co. of America**, Pittsburgh.

Robert R. Ashley was appointed manager of manufacturing of the Stratford, Conn., plant of **Detroit Controls Div.**, American Radiator & Standard Sanitary Corp.

Malcolm F. Judkins, formerly with Firth Sterling Inc., was appointed technical director, commercial production engineering, of **Sylvania-Corning Nuclear Corp.**, Bayside, N. Y. He will have headquarters at the Hicksville plant.

Gregg N. Moga was named a vice president of **Strategic Materials Corp.**, Buffalo. He will work jointly for Strategic and Koppers Co. Inc. as a special sales representative developing potential applications for the Strategic-Udy smelting-refining process.

Arthur M. Killin was named assistant to the works manager, **Union Carbide Metals Co.**, division of Union Carbide Corp. He will be in New York. He is succeeded as assistant manager of the Niagara Falls, N. Y., plant by **William W. Heilman.**

Griffin M. Stabler was made manager of production, **Alloy Tube Div.**, Union, N. J., Carpenter Steel Co. Former plant superintendent, he succeeds **Selden E. Doughty**, now manager of technical services. **Paul E. Kelly** was made manager of sales.

William D. Macgeorge was made chief engineer, **Tatnall Measuring Systems Co.**, Phoenixville, Pa., subsidiary of Budd Co. He was director of research and engineering at Automatic Timing & Controls Inc.

Kenneth E. Lewis was appointed division quality and process control manager, Stainless & Strip Div., **Jones & Laughlin Steel Corp.**, Detroit. He was manager of quality and process control for the division's Detroit and Louisville plants.

Richard J. Lystra, former manager of the Grand Blanc, Mich., stamping plant of **Fisher Body Div.**, General Motors Corp., was promoted to executive assistant to the general factory manager-fabricating in Warren, Mich. He is replaced as manager at Grand Blanc by **G. J. Bates**, who held a similar post at the Fisher Body stamping plant in Cleveland. **Rolland F. Smith** succeeds Mr. Bates in Cleveland. **Lewis J. Lamm** was made production manager at the Cleveland plant.

Gordon Meldrum was made assistant chief metallurgist of **Republic Steel Corp.'s** Central Alloy District, Canton and Massillon, Ohio. **Virgil W. Whitmer**, who has been assistant chief metallurgist, continues in this capacity, concentrating primarily on stainless steels and related specialty steels.

William J. Backus was promoted to manager, Cincinnati district office, **Clark Controller Co.** He replaces **James Orton**, now sales manager for Goods Roads Machinery Corp.

OBITUARIES...

Sheldon V. Wood, 75, chairman, **Minneapolis Electric Steel Castings Co.**, Minneapolis, died May 31.

Elmer Ellstrom Sr., 72, founder of **Dearborn Gage Co.**, Dearborn, Mich., died May 9.

Frank Ladish, 59, a vice president, **Ladish Co.**, Milwaukee, died May 24.

Goose Lake Ladle Brick

. . . on the job where you need it—when you need it!

Goose Lake Ladle Brick, produced only 55 miles from Chicago at famed Goose Lake, provides three important cost-saving factors for steel plants. *Fast, direct to job deliveries* by truck or train provides an important savings realized through the elimination of transit delays, demurrage, storage and rehandling . . . *available from stock for immediate delivery*, permitting you to save by maintaining low, flexible inventories . . . and, of course the most important savings is the *low delivered cost* offered by Goose Lake Ladle Brick. Write or phone today for a quotation . . . it should provide an "eye-opening" cost comparison.

Goose Lake Fire Brick is a dense, well-burned plastic-fire clay brick that provides excellent resistance to slags, spalling and abrasion. Strict quality-controlled production and excellent on-the-job performance has won continued specifications by leading steel men for Goose Lake Ladle Brick. Ideal for iron and steel ladles, cupolas, and general intermediate heat-duty requirement.

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Main Office—Barber Building, Joliet, Illinois
Sales Office—208 South LaSalle Street, Chicago 4, Illinois

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Two Steel Firms Cut Costs By Improving Facilities

GREATER EFFICIENCY in operations continues to be one of the main goals of the steel industry. It has been dictated largely by the steady rise in labor costs.

Two integrated companies, Wheeling Steel Corp. and Pittsburgh Steel Co., have announced completion of major improvement and modernization programs.

• **Wheeling Steel Corp.**—A $6 million continuous cleaning and annealing line has gone into production at its Yorkville (Ohio) Works, the company's tin plate producing unit. This second line has a capacity of 30 tons an hour, with a nominal speed of 1200 fpm. It is one of the final phases of a $35 million program that was started in 1956.

Completed phases of the program include: A 48 in., five stand, tandem mill for cold reducing hot strip; a temper rolling mill with auxiliary equipment to process wider strip in coils; annealing furnaces to replace older portions of the installation; electrolytic cleaning and scrubbing line; and hot strip pickling equipment.

• **Pittsburgh Steel Co.**—An eight year, $111 million expansion and improvement program has been completed, giving the company a product mix better slanted toward profitability. A large factor in the program to reduce production costs was construction of a $6 million billet mill at the Monessen (Pa.) Works. This six stand, continuous, 30 in. mill provides increased capacity and greater flexibility of rolling schedules.

The mill, built by United Engineering Co., rolls 8 x 9 in. blooms down to 4 in. squares, or 4⅝ in. to 7⅝ in. diameter rounds for seamless tubes. Roll changes take only 20 minutes; on the old mill, changes sometimes took as long as 8 hours.

The first part of the program consisted of construction of new hot and cold sheet mills at the Allenport (Pa.) Works. Other highlights of the rebuilding program are: A 50 per cent increase in coal unloading facilities on the Monongahela River at Monessen; addition of 19 byproduct coke ovens and auxiliary equipment; expenditure of $11.3 million for modernization of three blast furnaces; reconstruction of 12 open hearths from 150 to 220 ton capacities, lifting monthly capacity of the department to 130,000 tons; and installation of five blocks of soaking pits.

Ingots are rolled into either slabs or blooms on the new 46 in., high lift, blooming-slabbing mill. The 7000 hp mill can make either blooms for conversion into bars, billets or tube rounds, or it can produce slabs for conversion into sheets.

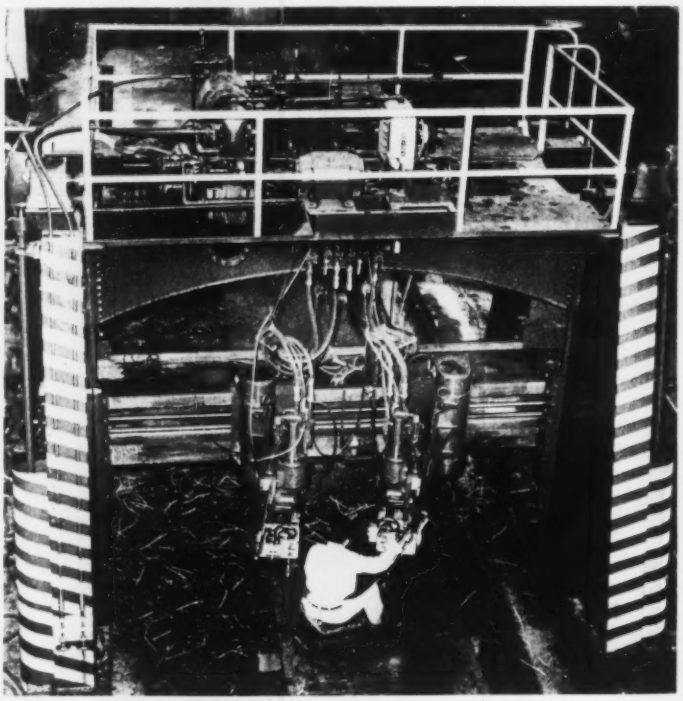
Important segments of the firm's program are in the planning stage or on the drawing boards. One such project is construction of an iron ore sintering plant.

Dow Invests at Louisiana

Dow Chemical Co. is starting $12 million worth of construction at its Louisiana Div., Plaquemine, La. The program includes a polyethylene plant (scheduled to be in production in 18 months) and facilities for vinylidene chloride and Chlorothene (slated for production in mid-1961).

Manages Mallory-Sharon

Bridgeport Brass Co., Bridgeport, Conn., has signed a five year contract to manage the Mallory-Sharon Metals Corp., Niles, Ohio. The metallurgical knowhow, fabricating facilities, commercial organization, and management resources of Bridgeport will be made available to the company. Mallory-Sharon produces titanium and ductile zir-



THIS 50-TON DRILLING AND REAMING GANTRY is in operation in the Maywood, Calif., plant of U. S. Steel's Consolidated Western Div. Mounted on rails with a net travel of 115 ft, the unit is self-powered, enabling it to move over large structural pieces. Equipped with four drill heads, it is capable of simultaneously drilling laterally spaced twin holes at any point within a range of 11.25 in. and 12 ft 4 in. Each drill is operated from a control panel on the side of the head

conium metal and mill products.

The Niles firm has booked a large order for commercially pure titanium (for anodizing automotive aluminum trim parts).

Broadens Conduit Line

Pittsburgh Standard Conduit Co., Pittsburgh, is producing rigid aluminum electrical conduit at its Verona, Pa., plant. The product will be processed from piping supplied under an exclusive agreement with Olin Mathieson Chemical Corp., New York. Aluminum conduit will be produced soon at Pittsburgh Standard's second plant at Morrisville, Pa.

Offers Cleaning Machine

Oster Mfg. Co., Wickliffe, Ohio, is manufacturing the copper finishing machine formerly made by Stockmeister & Prins, Wellston, Ohio. The machine combines operations that prepare and clean copper fittings and tubing for soldering.

Hupp Acquires New Line

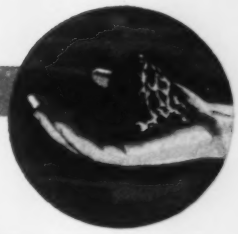
Hupp Corp., Cleveland, purchased the Valve Operator Div. of Cutler-Hammer Inc., Milwaukee. It follows acquisition of American Non-Gran Bronze Co., Berwyn, Pa. Manufacturing operations will be moved from Milwaukee to the Chicago plant of Hupp Aviation Co., a division of the Cleveland firm.

Casting Firm Expanding

Arwood Precision Casting Corp., New York, is expanding or modernizing its four plants which produce ferrous and nonferrous investment castings. The Los Angeles plant has increased its capacity 60 per cent and an additional building will be completed this summer. The Groton, Conn., plant has been enlarged to permit a 50 per cent increase in its capacity to handle large castings. The plant at Tilton, N. H., is expanding its building to meet increased demand for waveguide castings and to house new magnesium heat treating facilities. The Brooklyn, N. Y., plant has completed installation of x-ray equipment, a carbon restoration heat treating unit, and additional tooling facilities.

(*Please turn to Page* 94)

PROGRESS REPORT



Fabricating Columbium Alloys

First, let's settle the question "When is columbium niobium?" It depends on whether you're a chemist or a metallurgist. And since we are interested mostly in metallurgy at the TAPCO Group, we call it *columbium.*

Columbium is growing more and more interesting to the people with product design problems involving high operating temperatures, greater stresses, and severe oxidizing conditions. In fact, it is rapidly overtaking molybdenum as the expert's choice for refractory structural materials.

Because of this increased interest in columbium, now available in sufficient quantities, the TAPCO Group has been conducting an extensive columbium development program during the past eighteen months. This program, a joint venture with E.I. duPont de Nemours & Co., Inc., has contributed much information about the properties of columbium and has produced better methods of working with it.

ABOUT WORKABILITY—At TAPCO, forging methods have been investigated with a variety of columbium extruded bars. Excellent progress is being made on jet engine parts and missile structural components. One method used to produce turbine blades includes heating blanks to forging temperature in an Argon-flooded furnace, then press-forging them in conjunction with a TAPCO-developed die lubricant. Simple surface-polishing is all that is needed to finish these precision-forged parts.

An important phase of the TAPCO program is the development of welding procedures for columbium alloys. TAPCO welding engineers have successfully joined columbium by spot and seam resistance methods, have also fusion-welded columbium sheets successfully.

WHAT DOES COLUMBIUM OFFER? If you design or build aircraft engines, missiles or supersonic airframes, you'll be interested in the research the TAPCO Group and duPont have done to improve columbium properties.

It has excellent strength and shock resistance at greatly elevated temperatures... up to 2600 F, even 3000 F with some alloy compositions.

Now, about columbium *vs.* molybdenum. Columbium is easier to fabricate than moly. And much, much more resistant to elevated-temperature oxidation. For example, a simple columbium alloy is as much as 100 times better than moly on oxidation resistance. And a complex columbium alloy may be as much as 500 times better.

At TAPCO, coating materials for columbium are being developed, including one that reduces the oxidation of columbium at 2200–2300 F to practically zero.

WHERE TO USE COLUMBIUM—Columbium blades for jet engine turbines are an actuality... we'll be glad to show you finished forgings. Columbium also makes sense for such other jet engine "hot zone" parts as vanes, turbine wheels, after-burner liners, nozzles and nozzle flaps, and burner holders.

The use of columbium sheet seems very promising for missile structural components, such as leading edges, hinges, brackets, and the "ribs" and "skin" for airframes.

We would welcome an opportunity to tell you more about TAPCO's columbium research, and to discuss with you the many exciting possibilities of this space-age metal.

TRW

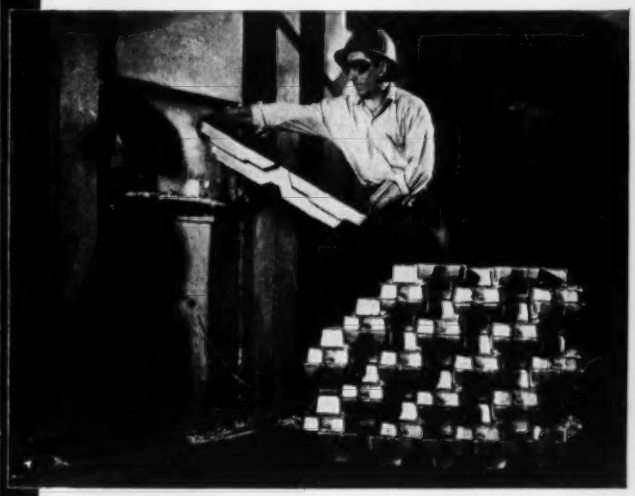
TAPCO GROUP

Thompson Ramo Wooldridge Inc.

Dept. ST-659 • Cleveland 17, Ohio

New handling efficiency. Locking one to another to form stable, rigid loads, new Alcan TRI-LOK ingots give you easier, faster handling with a wide variety of equipment . . . safer, more compact stacking. Save time from car unloading to storage and furnace charging.

Additional distribution (Alcan Foundry Alloys:) **Apex Smelting Co.**, Chicago, Cleveland, Los Angeles • **Charles Batchelder Co., Inc.**, Botsford, Conn.



Free standing. Alcan TRI-LOK ingot bundles maintain their rigidity and stability even when unbanded. This free-standing advantage is a real timesaver in carrying, storing and furnace charging. For Alcan TRI-LOK bundles need no pallets or special slings for pick-up, can be set right on the bare floor . . . safely.

Cuts unloading time. Alcan TRI-LOK bundles take the roughest handling. Interlocking design prevents "rolling" or "fingering" in transit . . . deep grooves keep straps tightly in place. The result: bundles arrive in excellent condition, ready for fast unloading by fork-lift truck. Alcan TRI-LOK bundles save checking time, too. Every bundle is a convenient one-ton, 40-ingot unit.

From Aluminium research . . .

ALCAN TRI-LOK ...a new ingot form especially designed to reduce your handling costs!

From a fabricator standpoint, the new Alcan TRI-LOK ingot may well be the most meaningful advance ever made in aluminum ingot design.

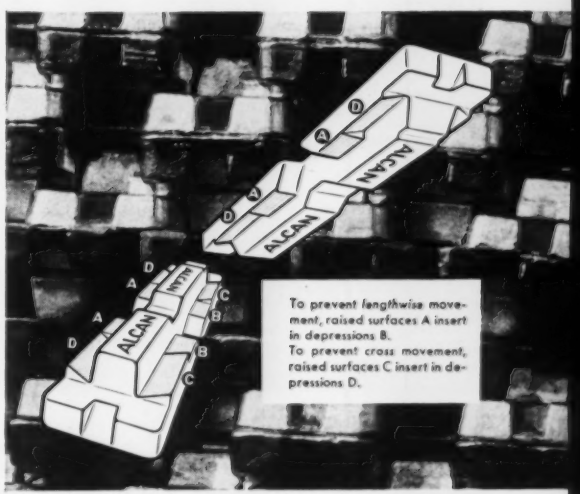
Here's a way to save time in every phase of ingot handling —the new Alcan TRI-LOK ingot!

Newest of Aluminium's ingot developments, Alcan TRI-LOK remelt ingots are especially designed for faster, more efficient handling. You see this handling ease in the safe, stable way the new ingots bundle and stack—locking one to another, not in just one, but in three different ways. The result: measurable cost savings in car unloading, handling and storage operations.

For information on the new Alcan TRI-LOK design—or aluminum in any other ingot form—just call or write your nearest Aluminium Limited sales office.

Aluminium
Limited

Ingot Specialist...serving
American Aluminum Fabricators—



Exclusive 3-way interlock. The Alcan TRI-LOK design is unique in that it prevents lateral movement of any kind. Within the stack or bundle, ingots are "mated" one to another, actually locking in three different ways. Despite excellent stacking stability, there's never an unlocking problem. *Just lift to separate!*

In the U.S.—Aluminium Limited Sales, Inc., 630 Fifth Ave., New York 20, N. Y. CLEVELAND • CHICAGO • LOS ANGELES • DETROIT • ATLANTA

Are Ball and Roller Bearings Important to Your Production?

Now you can make substantial savings on precision bearings with guaranteed assurance of quality and performance. International KOYO bearings are produced under the most rigid quality control standards in the world. Backed by 40 years of know-how in serving a world-wide market, these are anti-friction bearings of *every type . . . every size . . .* and of *unequaled quality*. Manufactured under an exclusive patented forging process, these bearings are available in any degree of high precision.

A Product of American and Japanese Teamwork

Manufactured in Japan in one of the world's most modern bearing plants, International KOYO bearings are an outstanding example of American and Japanese teamwork. Millions of dollars in precision American machine tools are used in their manufacture. In addition, 95% of the iron ore used in the bearing steel is a product of the U. S.

If you are looking for *longer life . . . greater load capacity . . .* and *lower costs* in your bearings, investigate International KOYO—the *most complete line* of quality bearings in the world market!

FOR COMPLETE INFORMATION WRITE

International

BALL & ROLLER BEARING CORP.

GENERAL OFFICES: 3123 Eastlake, Seattle 2, Washington

(*Concluded from Page* 91)

heat treating unit, and additional tooling facilities.

Enlarges Aluminum Plant

Aluminum Co. of Canada Ltd., Montreal, Que., will increase capacity of its mill at Kingston, Ont., by 10,000 tons a year. The plant produces aluminum sheets, foil, forgings, tubing, structural shapes, architectural shapes, and other extrusions.

Ryerson Builds in Chicago

Joseph T. Ryerson & Son Inc., subsidiary of Inland Steel Co., Chicago, is erecting a building adjacent to its plant at 16th and Rockwell Streets, that city. Completion is scheduled for late in 1960. It will house general office personnel for the nationwide group of 20 Ryerson steel service centers.

Stelco Steps up Expansion

Steel Co. of Canada Ltd., Hamilton, Ont., is installing a continuous galvanizing and aluminum coating line. The expansion, second to be announced this year, will involve expenditure of "several million dollars." (A continuous galvanizing line built five years ago cost about $8 million.) The new facility is a universal line capable of producing zinc and aluminum coated steel (in sheets and coils) in light and heavy gages.

Installs Plating Line

National-Standard Co., Niles, Mich., has installed continuous plating equipment, principally to double its output of copper-plated steel wire. The firm's process electrolytically plates copper around a steel wire core.

Kaiser Completes Program

Operation of the $70 million Gramercy (La.) Works of Kaiser Aluminum & Chemical Corp., Oakland, Calif., marks the completion of a $400 million expansion program started in 1955. The Gramercy plant has a capacity of 430,000 tons of alumina a year. The over-all program included a primary aluminum reduction plant

and an adjoining sheet and foil rolling mill on the Ohio River at Ravenswood, W. Va., and the enlargement of several other facilities producing fabricated and semi-fabricated aluminum products.

Kaiser put its fourth potline into operation at its primary aluminum reduction plant at Ravenswood on June 1. It has an annual capacity of 145,000 tons.

Plating Division Formed

A new plating division has been opened by EverLube Corp., North Hollywood, Calif. The firm compounds dry film lubricants. It will specialize in plating precious metals, cadmium, and copper.

Stanley Changes Name

Stanley Building Specialties Co., North Miami, Fla., has changed its name to Stanley Building Specialties Div., Stanley Works.

Bell Quits Business

David Bell Co., Buffalo, has ceased operations. The 115-year-old screw machine firm had 250 on the payroll during World War II.

ASSOCIATIONS

Albert M. Nutter, E. L. LeBaron Foundry Co., Brockton, Mass., was elected vice president of the **National Castings Council**, Cleveland. Mr. Nutter is president of the Gray Iron Founders' Society Inc., that city, a founding member of NCC. Council membership includes 11 foundry industry associations.

C. E. Haney, Electric Steel Foundry Co., Portland, Oreg., was elected president of the **Aircraft Castings Association**, El Cajon, Calif. Other officers are: Vice president, William Stevens, Stanley Foundry of Los Angeles; and secretary, Dar Howell, Hanford Foundry Co., San Bernardino, Calif.

American Gear Manufacturers Association, Washington, elected these officers: President, J. L. Buehler, Indiana Gear Works Inc., Indianapolis; vice president-Technical Div., Folke Richardz, Westinghouse Electric Corp., Pittsburgh; vice president-Products Div., J. F. Murray, Winsmith Inc., Springville, N. Y.; treasurer, C. F. Bannan, Western Gear Corp., Lynwood, Calif.; and executive director, John C. Sears.

Donald R. Wadle will resign Sept. 30 as managing director of the **Metal Lath Manufacturers Association**, Cleveland. He will be succeeded by Jack Fisher, technical director of MLMA.

William F. Chase, Bearing Service Co., Pittsburgh, has been re-elected chairman of the **National Association of Bearing Specialists.**

J. H. Foote, Commonwealth Associates, Jackson, Mich., was elected president of the **American Institute of Electrical Engineers**, New York.

Charles M. White, Republic Steel Corp., Cleveland, was elected chairman of the **National Industrial Conference Board**, New York.

American Tin Trade Association, New York, elected these officers: President, A. C. Jaros, Metal Traders Inc.; vice president, Elmer E. Stewart; and treasurer, Heinrich Meyer, Ayrton Metal & Ore Corp., all of New York.

Volatile Inhibitor Manufacturers Association elected these officers: President, E. D. Cookson, Ludlow Papers Inc., Needham Heights, Mass.; vice president, E. L. Orchard, Orchard Paper Co., St. Louis; vice president, W. A. Spencer, Daubert Chemical Co., Chicago; and secretary-treasurer and counsel, Samuel T. Lawton.

Society of the Plastics Industry Inc., New York, elected these officers: President, R. C. Weigel, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del.; vice president, R. L. Davidson, Kurz-Kasch Inc., Dayton, Ohio; and secretary-treasurer, E. J. Caughlin, American Insulator Corp., New Freedom, Pa.

Magnesium Association, New York, re-elected Otis Grant, Magnode Products Inc., Trenton, Ohio, president. Re-elected vice presidents were Charles Howe, Hills-McCanna Co., Chicago, and John

PORCELAIN ENAMEL

FOR
SMALL PARTS
ON
STEEL·COPPER·STAINLESS

for resistance to
- acids and alkalis
- corrosion
- moisture
- abrasion
- heat and cold
- oils and solvents

for
- permanence
- cleanliness
- non-staining
- non-fading
- high reflectivity
- beauty

Services and Facilities

Automatic, precision equipment permits you to take full advantage of porcelain enamel finishes at prices well in line with competitive, less suitable materials. Intricate silk screened designs a specialty.

Write for literature and specific proposals on your requirements.

SMALL PARTS PORCELAIN ENAMELED
ECA
ERIE CERAMIC ARTS CO.

THE ERIE CERAMIC ARTS COMPANY
ERIE, PENNSYLVANIA

DURALOY

25-20 Casting with Welded Assembly

This is a separator destined for a reaction process. It is typical of the kind of work we do in the high alloy casting field. In the 25 Cr-20 Ni range it is alloyed to withstand both corrosion and heat. Assembled, its weight runs some 2000 pounds. It was inspected and tested under very rigid ASME Code requirements.

The production of chrome iron and chrome nickel castings has been our sole business since 1922. We added centrifugal castings to our service in 1933 and shell molded castings in 1955. Our metallurgists have extensive knowledge of the many operations requiring high temperature and corrosion resistant castings. Perhaps this experience would be helpful to you if you are confronted with a specific problem and wish to determine the best alloying combination for your required castings. We can be helpful, too, in designing the unit, contributing our knowledge of strength and stresses in castings.

The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

Thomson, Dominion Magnesium Ltd., Toronto, Ont. Jerry Singleton was named executive secretary and Norman Gzowski, Garfield Alloys Inc., Cleveland, became treasurer.

CONSOLIDATIONS

Baker Industrial Trucks Div., Otis Elevator Co., Cleveland, purchased **Northland Equipment Co.**, Detroit. W. F. Chesley has been named manager of Baker's Detroit branch.

Greenville Steel & Foundry Co., Greenville, S. C., merged with **Carolina Steel Corp.**, Greensboro, N. C. Salem Steel Co., Winston-Salem, N. C., is a division of Carolina Steel. They will continue to operate as separate corporations and will maintain steel service centers, offering tonnages of hot and cold rolled, stainless, and other types of steel. The Greenville firm will continue the fabrication of stainless steel textile dyeing and finishing equipment.

NEW OFFICES

Harvey Aluminum, Torrance, Calif., opened a sales engineering office at 530 Silas Deane Highway, Hartford, Conn. Douglas Kaplinger is district sales manager. The firm moved its Bay Area sales engineering staff to larger quarters at 2015 Center St., Berkeley 4, Calif. Robert Sand is district sales manager.

Aluminium Ltd. Sales Inc., New York, opened a sales office at 10 S. Brentwood Blvd., St. Louis, under the managership of R. H. T. Dodson.

Wolverine Tube Div., Calumet & Hecla Inc., Allen Park, Mich., established a district sales office and mill depot at 7040 W. Cullom Ave., Norridge 34, Ill. Carl T. Fuller is Chicago district sales manager.

Benjamin Metals Co., Los Angeles, has moved its offices and warehouse to Compton, Calif. The new facility covers 25,000 sq ft and

(*Please turn to Page* 100)

in IR heavy-duty compressors

these EXTRA-VALUE FEATURES mean top performance and economy

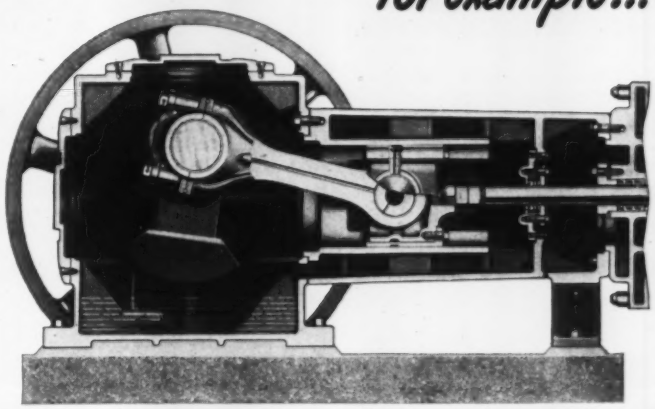
FULL-FLOATING ALUMINUM BEARINGS
Roll with the punch of each stroke to distribute load

FULL FORCE-FEED LUBRICATION
Filtered oil under pressure to all bearing surfaces

SEALED FRAME
Keeps dirt out • Keeps oil in
Keeps wear down

AIR-CUSHIONED CHANNEL VALVES
Highest efficiency • Exceptional durability • Quiet operation

take the SEALED FRAME for example...



dust-tight, oil-tight bolted covers protect all parts; seal never needs to be broken for adjustments

In Ingersoll-Rand compressors, all running parts are protected from dirt and leakage by the tightly-sealed frame construction. There are generous openings for access, of course, but these are sealed by bolted, gasketed covers. Dirt is a major cause of wear in all machinery, and when it is kept out, wear is naturally minimized.

The frame may be kept sealed, since there is no need for internal adjustments. Bearings are the full-floating type which never need adjusting, and the full-floating metallic compressor rod packing adjusts itself! All parts are designed to take years of heavy-duty operation, and repairs or replacements will be rare.

This is only one of the quality features which have earned the Ingersoll-Rand compressor line its reputation for excellence. For more information about compressors of all types and sizes from ½ to 7500 hp, for pressures to 35,000 psi and vacuums, call your I-R representative today.

ESH
20 to 150 hp.

PHE
75 and 100 hp.

XLE
125 to 350 hp.

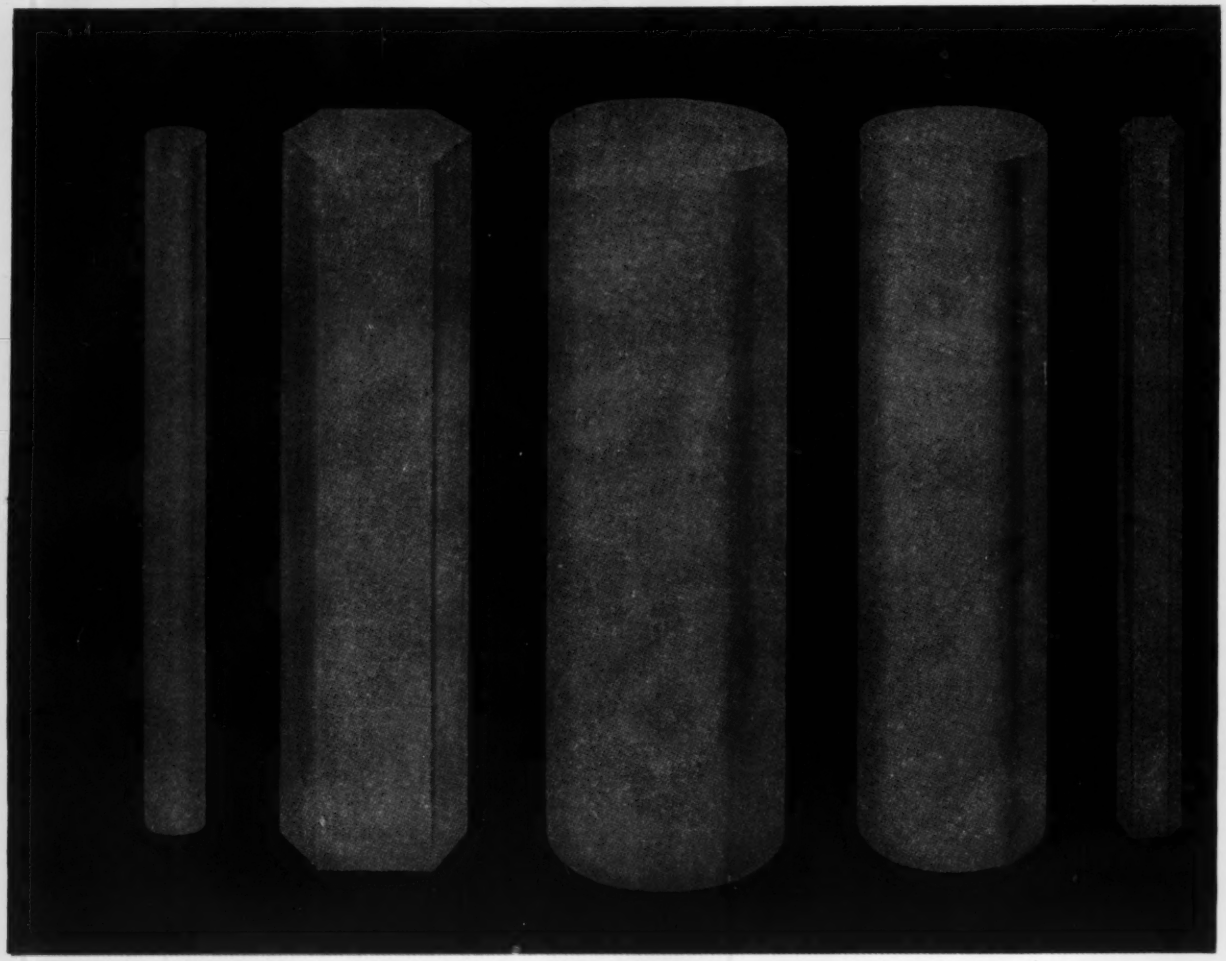
PRE
400 to 2000 hp.

XPV
(Steam-driven)
200 to 1500 hp.

Ingersoll-Rand
1-888 11 Broadway, New York 4, N. Y.

COMPRESSORS • GAS & DIESEL ENGINES • PUMPS • AIR & ELECTRIC TOOLS • CONDENSERS • VACUUM EQUIPMENT • ROCK DRILLS

READY and



Bridgeport–a new prime

HOW NEAR IS YOUR PHONE? Bridgeport's new and expanded warehouse service on aluminum, brass and copper is just that close!

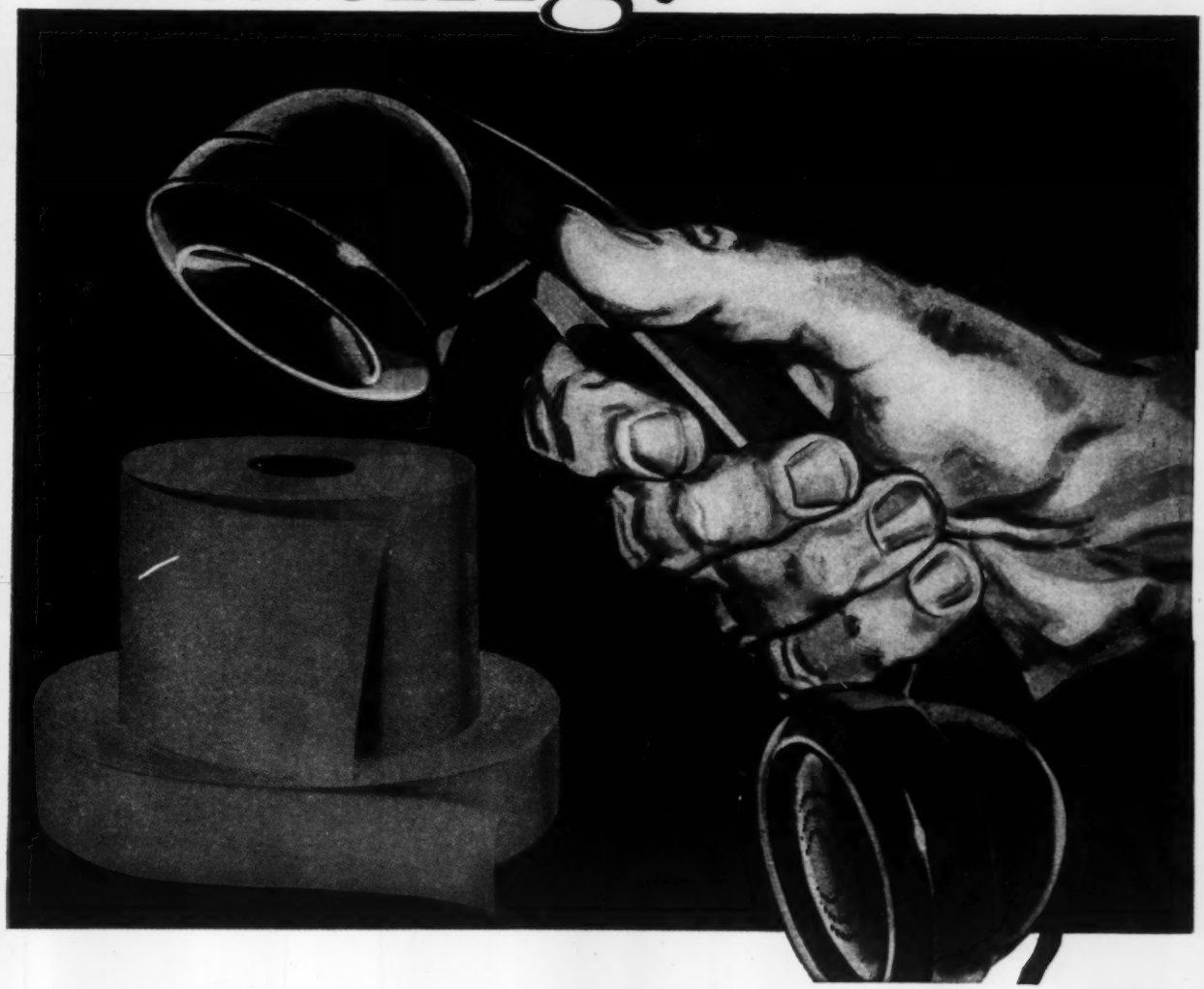
Of course, the added convenience of fastest delivery is only *one* of the advantages Bridgeport offers. You can also count on "all-the-way-through" quality that's the result of exacting care in alloying, tempering, finishing and testing. Careful adherence to tolerances, too. In fact, when you dial your Bridgeport warehouse, you're dialing *a tradition*—of service, of quality!

What's more, these same warehouse facilities are the perfect service source for special aluminum shapes, extrusions. Copper and brass alloys, too. Start *today* to get prime products, prime service—from Bridgeport!

Bridgeport Aluminum Screw Machine Rod

Alloys:	2011-T3 2017-T4 2024-T4 6061-T6
Diameters:	½" to 2" Rounds or Hexagonals
Lengths:	12-foot standards

waiting!



source for ALUMINUM

Bridgeport Aluminum Coiled Sheet

Alloys: 1100 3003 3004 5005 5050 5052 5357

Widths: Up to 24" • Gauges: .006 to .064

Tempers: All commercial. Slitting service available.

Check these Bridgeport warehouses and offices for fast, local service

CHICAGO: LAfayette 3-2230
CLEVELAND: CEdar 1-5180
DENVER: MAin 3-0273, AComa 2-4108
ST. LOUIS: CEntral 1-0076
LOS ANGELES: RAymond 3-5101, PArkview 1-5171
MINNEAPOLIS: FEderal 9-7061
NEWARK (Hillside): Bigelow 3-0044
SAN FRANCISCO: UNderhill 1-2551
NEW YORK: EXeter 2-4290
PHILADELPHIA: JEfferson 5-3900
PROVIDENCE: Williams 1-2100

BRIDGEPORT BRASS COMPANY
Bridgeport 2, Connecticut • Sales Offices in Principal Cities
Specialists in Metals from **A***luminum to* **Z***irconium*

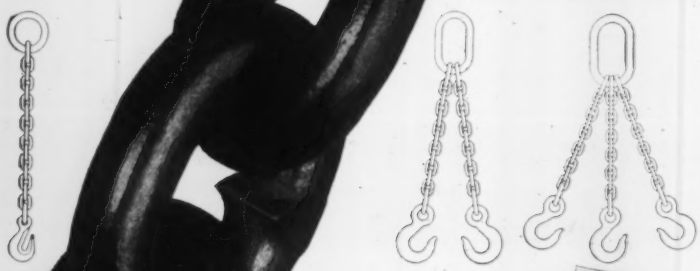
HERC-ALLOY

THE ORIGINAL ALLOY STEEL CHAIN

● Herc-Alloy is a special all-purpose chain with long-wearing properties and high resistance to impact loading.

● Herc-Alloy is sold in running lengths and in all types and sizes of sling chains assembled to customers' specifications.

● CM also produces a complete line of chain attachments and welded chain of all types including stainless steel and bronze.



● Write for literature covering Herc-Alloy Sling Chains, including helpful information on their assembly, care, use and inspection.

Hammerlok®
COUPLING LINKS

● Assemble or rebuild your own Herc-Alloy sling chains with all components furnished by your local distributor. Hammerlok is simple, safe, reusable. New Herc-Alloy assemblies can now be ordered with welded or Hammerlok Coupling Links as desired.

CM CHAIN

CALL YOUR CM CHAIN DISTRIBUTOR

COLUMBUS McKINNON
CHAIN CORPORATION
Tonawanda, New York
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LOS ANGELES • SAN FRANCISCO
In Canada: McKINNON COLUMBUS CHAIN LTD., ST. CATHARINES, ONT.

Herc-Alloy®

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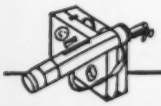
cost $175,000. The firm warehouses steel, aluminum, and brass.



VACATIONS

Greer Steel Co. will close its Dover, Ohio, plant from June 27 through July 12 and its Anderson, Ind., plant from July 11 through July 26. Partial service will be maintained at the firm's general office.

Okonite Co. will close its Passaic, Paterson, and North Brunswick, N. J., factories from July 6 through July 19. The firm's Kennecott Wire & Cable Div. at Phillipsdale, R. I., will be shut down from June 29 to July 13. Regular shipments will be made from service centers and emergency shipments of wire and cable will be made from mill stocks.

Chase Brass & Copper Co. will close its Waterbury, Conn., Mill and Forging Div. from July 20 to Aug. 3; its Cleveland mills, from July 6 to July 20. Branch service centers and sales offices will be open for shipments from warehouse stocks. Shipments can also be made from mill stocks.

McGill Mfg. Co. Inc., Valparaiso, Ind., will be closed from 5 p.m., July 10, until 8 a.m., July 27.

Resistoflex Corp., Roseland, N. J., will close its plant and main office at 5 p.m., July 24 and will reopen at 8 a.m., Aug. 10.

NEW ADDRESSES

Cardox Div., Chemetron Corp., moved its headquarters to 840 N. Michigan Ave., Chicago, Ill., in the Chemetron general office building.

National Fluid Power Association moved its headquarters to 5595 N. Hollywood Ave., Whitefish Bay, Wis. Barrett Rogers is executive vice president and secretary.

Century Electric Co., St. Louis, has moved two branch offices. New addresses: 1821 State St., Bettendorf, Iowa; 3318 W. Cary St., Richmond, Va.

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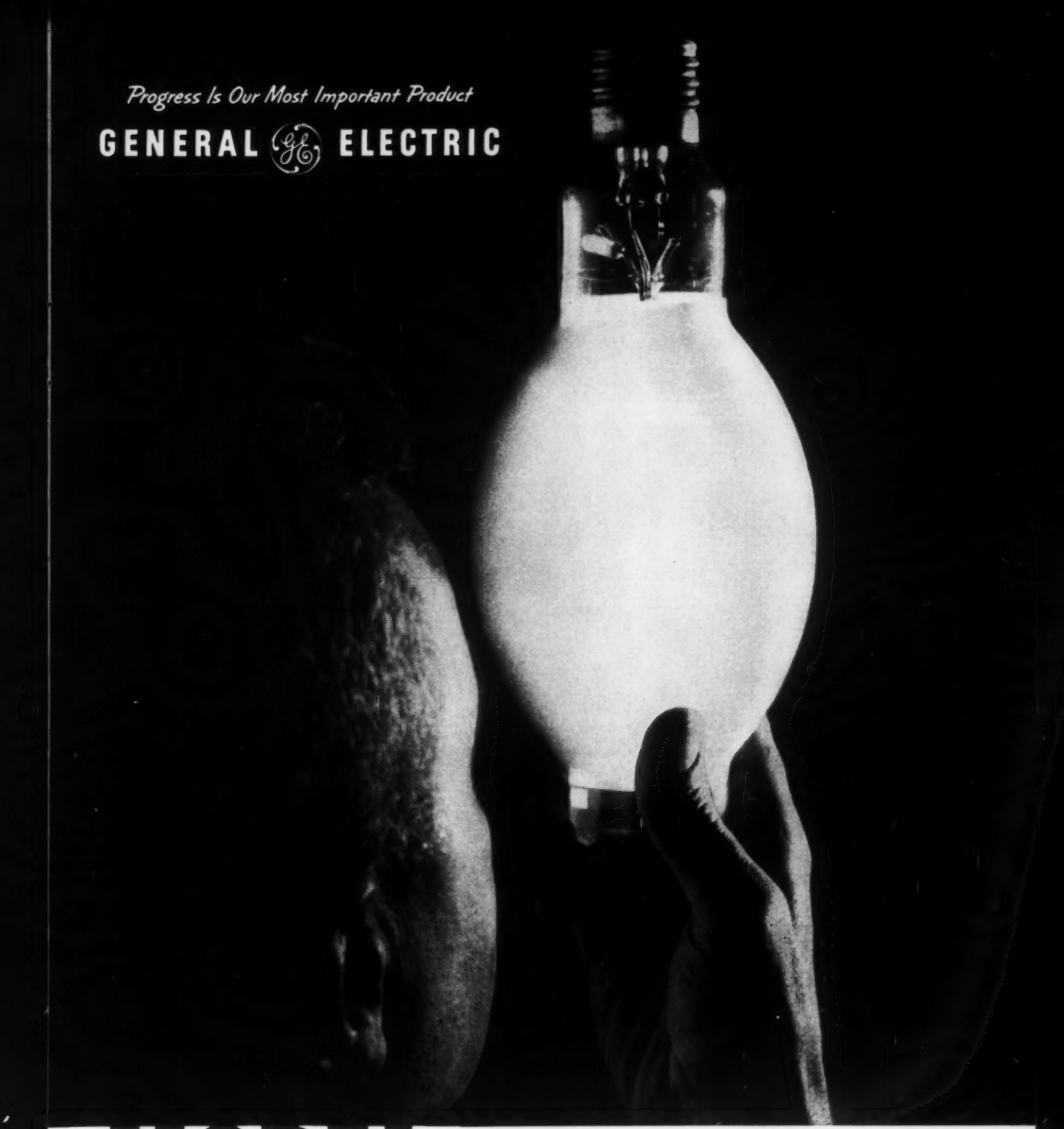
GENERAL ELECTRIC

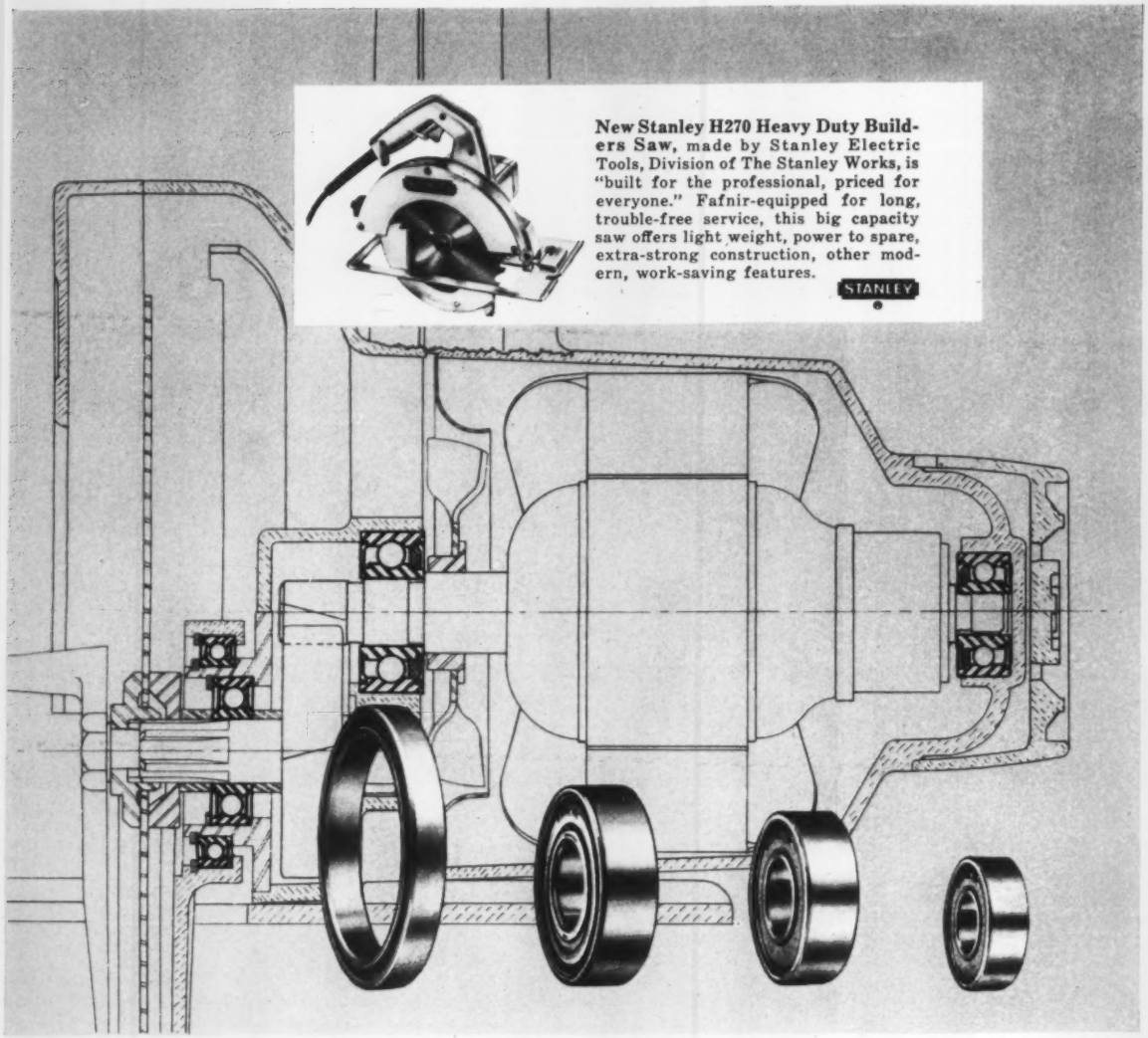


MORE!

"Even in the middle of summer, *everybody's* happy when *this* mercury goes up. It's a General Electric Mercury Lamp . . . and when it goes up in a socket, our lighting level, employee morale and production figures go up, too. But our cost of light drops like a barometer in an approaching storm.

General Electric Mercury Lamps, *at any given time in their life, will outperform other brands the same age.* What's more, they're built to last as long or longer than any other. It figures . . . after all, G. E. is first in mercury . . . just as they are in fluorescent and filament lamps. So, I'll stick with the leader."

General Electric Co., Large Lamp Dept. C-923, Nela Park, Cleveland 12, Ohio



New Stanley H270 Heavy Duty Builders Saw, made by Stanley Electric Tools, Division of The Stanley Works, is "built for the professional, priced for everyone." Fafnir-equipped for long, trouble-free service, this big capacity saw offers light weight, power to spare, extra-strong construction, other modern, work-saving features.

STANLEY

New Stanley power saw, Fafnir ball bearing equipped, designed to deliver nearly 40% more cutting force!

Armature, saw shaft, even the blade guard Fafnir-mounted for free-starting, no-maintenance, heavy-duty performance

Nearly 40% more cutting force at working speeds, with 27% less operator effort! This new Stanley power saw represents a design achievement of the first order. And to insure long, efficient service life, Stanley makes generous use of Fafnir precision ball bearings. Even the blade guard is Fafnir-equipped (with an aircraft type bearing), for responsive action at the slightest pressure. On the armature and saw shaft, Fafnir ball bearings all but eliminate friction and wear. Bearing maintenance is eliminated, too. Various combinations of seals and shields lock out contaminants, lock in factory-packed lubricant. No danger of faulty or neglected lubrication... virtually no chance of bearing failure.

Take advantage of Fafnir's "designer's approach" to bearing problems. You'll find Fafnir's breadth of experience and diversity of line insure precise answers. Write The Fafnir Bearing Company, New Britain, Connecticut.

Sealed and shielded Fafnir ball bearings meet specific service requirements in Stanley saws

Felt seal and shield (Motor Armature)

2 Plya-Seals (Blade Guard)

Plya-Seal and shield (Saw Shaft)

FAFNIR BALL BEARINGS

A SPECIAL STEEL STUDY

For Managers Who Keep Up With Progress In Technology

TRENDS IN METALS

Aluminum's on the Move

MEN OF VISION have known for a long time that aluminum would go places.

Napoleon was among the first to recognize the metal's broad potential. (He wanted to aluminize his armies with lightweight equipment.)

In 1884, farsighted builders mounted a cast aluminum pyramid on the tip of the Washington National Monument. (It's still there and in good shape.)

The fathers of the Air Age, Orville and Wilbur Wright, anticipated the dependence of the aircraft industry on aluminum by using it in the engine that powered their historic flight in 1903.

Those men (and others like them) would have speeded up the commercial debut and acceptance of aluminum if two things (both related) had been in their favor: Availability and price. In Napoleon's day, the metal cost $545 a pound. The 100 ounce pyramid on Washington's Monument cost $225 in 1884, counting metal and manufacture. What has proved to be the turning point came two years later when another man of vision, Charles Martin Hall, invented a feasible production process, which is still the basic method today. Aluminum has been on the move ever since.

Thanks to the Hall process, the Wright brothers had to pay only $2 a pound for their aluminum. By 1918, the infant industry was able to supply the Allies with 90,000 tons of the metal for aircraft. By 1942, it was estimated that the U. S. had the production capacity to put a 30 piece cooking utensil set in every one of the country's 34 million homes and have enough left over to build 5 million miles of electrical transmission lines.

Today, aluminum (about 25 cents per lb for pig) is the second most used metal. U. S. primary capacity was 2,184,250 tons annually in January and will climb 270,500 tons during the year. Next year, 150,000 tons will be added. Primary production this year will probably rise to an all-time high of around 1.9 million tons. Currently it's running at an annual rate of 1,969,500

Bauxite Reserves Are Growing

	(MILLIONS OF LONG TONS) October, 1950	December, 1958
North America	390	683
South America	307	171
Europe*	532.2	671
Asia**	116.6	145
Africa	235.5	429
Oceania	24	603
Totals	1,605.3	2,702

*Includes Soviet bloc.
**Includes Red China.

Source: U. S. Bureau of Mines.

tons. Some companies think U. S. consumption alone will reach 4.2 million tons annually by 1965, 10 million tons by 1975.

• **More Metal**—The whole world is stepping up its capacity. Last year around 3.8 million tons of primary were produced (890,000 tons of it by the Soviet bloc). By the end of 1959, world capacity will be about 5.1 million tons yearly—and virtually every country except the U. S. and Canada will be operating at 100 per cent of capacity.

For years, Canada has been an important source of supply for many metalworking firms. The two Canadian producers have a yearly capacity of 866,000 tons and another 90,000 tons partially completed. Of the 255,321 tons of pig imported last year, Canada supplied the bulk (modest tonnages came from France and Norway). Pig imports this year will probably fall to around 215,000 tons, estimates the Business & Defense Services Administration.

But imports of fabricated shapes (from Belgium, West Germany, Italy, France, Yugoslavia, and Japan) are on the rise. They jumped from 19,000 tons in 1957 to over 28,000 tons last year. This year, such imports could exceed 42,000 tons.

As world capacity gains, it appears certain that more and more foreign fabricated shapes will flow into the U. S. Take Russia: Her seven year plan calls for a capacity of 1,620,000 tons by 1960, 3,586,000 tons by 1965. A lot of that production is probably slated for export.

One thing's certain: It's doubtful if U. S. exports will ever again exceed or even come close to equaling imports.

It's likely that domestic producers will penetrate overseas markets by establishing foreign affiliates through joint ownership of reduction and fabricating plants with local companies.

It's possible that pig exports may be stepped up in the future to supply such affiliates.

• **Scrap to Increase**—An increasingly important source of aluminum comes from the remelt and sale of old and new scrap. The 83 U. S. smelters supply about 20 per cent of domestic needs. Last year the custom aluminum industry produced 353,000 tons of ingots. This year it'll turn out an estimated 425,000 tons.

Capacity of the custom industry is pretty much determined by the amount of scrap available. It now has an annual alloying capacity of around 450,000 tons. Carl Burton, secretary, Aluminum Smelters Research Institute, thinks the smelting industry could increase its alloying capacity within a reasonably short time to approximately 625,000 tons.

The scrap supply has spiraled in recent years—from 80,400 tons in 1940 to 445,000 in 1957. New scrap is still the principal source of supply, but with the decline in aircraft output and more efficient production methods, less is being generated per pound of aluminum consumed.

Looking ahead, old scrap will become a bigger factor. Products with relatively short life cycles, such as autos, will spur the generation of old scrap and result in increased smelter output. One metalman predicts: By 1965, smelters will produce 900,000 tons annually.

• **Availability** — Add up primary production, smelter output, and pig imports, and you get a good idea of the metal available to U. S. users. (STEEL estimates for '59: 2,540,000 tons.)

While the industry is facing formidable oversupply problems now, it's almost cocky about its future. Even if estimates of consumption in the sixties and seventies are realized, it's inconceivable that the U. S. will have a shortage of aluminum. Here's why: Our domestic primary producers and smelters will make sure they can supply as much metal as the public wants.

It's also likely that other domestic companies will begin producing the metal.

Finally, if we do have a shortage, exports would probably fill the gap.

Certainly the supplies of bauxite are big enough to make such consumption possible (see table on this page).

Tremendous quantities of ore are probably yet to be uncovered. All six domestic primary producers have extensive ore explorations programs underway in virtually every corner of the Free World.

• **Trends**—Watch the "hot" or "molten metal" contracts. (A primary reduction plant and customer foundry are built side by side, and the metal is shifted from the reduction facility to the foundry in liquid form for immediate casting.)

• More and more reduction plants will be located with an eye toward ready access to major markets.

• Coal will continue to replace hydroelectric facilities as power sources.

• Because of the industry's heavy electrical needs (it takes around 3 per cent of all power generated in this country), it may be among the first to adopt atomic energy.

Aluminum and Aluminum-Base Alloy Producers And What They Make

(Warehouse items not included)

	Semifinished*	Sheets or Strip	Plates	Rolled Bars, Rods, or Wire	Extruded Bars, Rods, or Shapes	Pipe or Tubes	Powder	Shot, Granulated or Notched Bars	Structurals	Foil
ALLOYS & CHEMICALS MFG. CO. INC. Cleveland	X							X		
ALUMINUM & MAGNESIUM INC. Sandusky, Ohio	X									
ALUMINUM CO. OF AMERICA Pittsburgh	X	X	X	X	X	X	X	X	X	X
ALUMINUM FOILS INC. Jackson, Tenn.	X	X								X
AMERICAN SILVER CO. INC. Flushing, N. Y.		X								X
ANACONDA ALUMINUM CO. Louisville	X	X	X		X	X			X	X
ANACONDA WIRE & CABLE CO. New York				X						
APEX SMELTING CO. Chicago	X			X				X		
BELMONT SMELTING & REFINING WORKS INC. Brooklyn, N. Y.	X	X	X	X	X	X	X	X		X
BOHN ALUMINUM & BRASS CORP. Detroit	X				X					
BRIDGEPORT BRASS CO. Bridgeport, Conn.		X			X	X			X	
BRIDGEPORT ROLLING MILLS CO. Bridgeport, Conn.		X								
CHASE BRASS & COPPER CO. Waterbury, Conn.		X								
CLEVELAND ELECTRO METALS CO. Cleveland	X							X		
H. COHN & SONS INC. Chicago	X									
FEDERATED METALS DIV., American Smelting & Refining Co. New York	X									
MICHAEL FLYNN MFG. CO. Philadelphia	X				X	X			X	
GENERAL SMELTING CO. Philadelphia	X							X		
SAMUEL GREENFIELD CO. Buffalo	X									
HARVEY ALUMINUM Torrance, Calif.	X				X	X			X	
HENNING BROS. & SMITH INC. Brooklyn, N. Y.	X							X		
JOHNSTON FOIL DIV., Standard Packaging Corp. St. Louis										X
KAISER ALUMINUM & CHEMICAL CORP. Oakland, Calif.	X	X	X	X	X	X		X	X	X
NIAGARA FALLS SMELTING & REFINING DIV., Continental Copper & Steel Industries Inc., Buffalo	X							X		
NICHOLS WIRE & ALUMINUM CO. Davenport, Iowa		X		X						
NORTHWESTERN METAL CO. Lincoln, Nebr.	X							X		
OLIN ALUMINUM METALS DIV.,† Olin Mathieson Chemical Corp., New York	X	X	X	X	X	X				
PRECISION EXTRUSIONS INC. Bensenville, Ill.	X				X	X			X	
PRECISION TUBE CO. INC. North Wales, Pa.						X				
QUAKER STATE METALS CO. Lancaster, Pa.		X								
REPUBLIC FOIL INC. Danbury, Conn.										X
REVERE COPPER & BRASS INC.† New York	X	X			X	X				X
REYNOLDS METALS CO. Richmond, Va.	X	X	X	X	X	X	X	X	X	X
ROCHESTER SMELTING & REFINING CO. INC. Rochester, N. Y.								X		
RODNEY METALS INC. New Bedford, Mass.		X								
GEORGE SALL METALS CO. INC. Philadelphia	X							X		
SCOVILL MFG. CO. Waterbury, Conn.		X								
SHEET ALUMINUM CORP. Jackson, Mich.		X								
SONKEN-GALAMBA CORP. Kansas City, Kans.	X							X		
U. S. REDUCTION CO. East Chicago, Ind.	X							X		

*Includes ingot, pig, tube blooms, and extrusion billets. †Obtains semifinished from Ormet Corp., New York.

SURVEY of USERS

Expect aluminum to continue its spectacular growth. In check of 3000 metalworking plants, STEEL found: Three in four will expand their requirements in the next five years, one in three plans new use for aluminum, 38 per cent are switching from another material to aluminum, most think suppliers are doing good sales and service jobs. Of current nonusers, one in ten plans a future use. Nearly three out of four metalworking plants use aluminum or its alloys now

Distribution of Users

TONS (annual consumption)	1959	1958
Less than ½	5%	6%
½ to 2½	13	15
2½ to 5	8	7
5 to 12½	14	17
12½ to 25	9	8
25 to 50	9	9
50 to 100	14	12
100 to 250	11	11
250 to 500	7	6
More than 500	10	9

Five Years from Now . . .

. . . 73% Will Use More

22% will use 0-10% more
30% will use 11-20% more
10% will use 21-30% more
11% will use over 30% more

. . . 6% Will Use Less

. . . 21% Will Use Same Amount

38% Are Switching to Aluminum

What they're switching from:

Carbon steel	57%
Copper	31
Stainless steel	15
Alloy steel	11
Wood	5
Zinc	4
Plastics	3
Other materials	24

*Figures will add to more than 100 per cent because some firms are switching from more than one material.

What Nonusers Say

10% Plan Future Uses

Only 9% Switched from Aluminum to Another Material

1. A Texas firm changed to stainless steel since it must use a caustic cleaner.
2. A maker of jewelry, clothing fasteners, and military insignia reports: "Inability to solder and color aluminum prevents us from using it."
3. A producer of bottle washing machinery can't use aluminum because it corrodes in contact with sodium hydroxide.
4. A kitchen cabinet maker switched from aluminum to steel.

Where They Buy

74% Distributors & warehouses
52% Primary producers
21% Independent fabricators
7% Smelters
3% Foreign sources
8% Other

*Figures will add to more than 100 per cent because some firms buy from several sources.

What They Want From Suppliers

(Per cent of users who listed each factor)

Stabilize prices	44%
Carry more complete stocks	31
Improve deliveries	28
Pioneer new uses	26
Maintain closer tolerances	25
Give engineering assistance	21
Employ better trained salesmen	8
Other	6

60% Want New or Improved Properties

Most common desires:

Better weldability.
Increased tensile strength.
Brighter finishes.
Better corrosion resistance.
Higher heat resistance.
Improved casting alloys.
Easier machinability.
Greater electrical conductivity.
Better anodizing qualities.

95% Say Specifications Are Met

Others have these complaints:

Tolerances not close enough.
Surface quality not good enough.
Castings too porous.
Variations from one mill to another.
Bonding difficulties.
Soft sections in coiled sheet.
Extrusions pit after caustic etch treatment.

99% Believe Suppliers Will Meet Their Future Needs

What Users Do to Aluminum

Fabricating Operations

68% do 3 or more
41% do 5 or more
8% do 10 or more

Categories:

Bending	50%
Brazing	17
Casting	12
Drawing (incl. ironing)	18
Drilling or tapping	64
Extruding	3
Impact extruding	1
Forging	1
Mechanical fastening	28
Milling	32
Roll forming	17
Soldering	12
Spinning	8
Stamping	42
Threading	36
Turning	39
Welding	37
Other machining	21

Finishing Operations

26% do 3 or more
11% do 5 or more
0.3% do 10 or more

Categories:

Apply paints, lacquers, or enamels	52%
Anodizing	30
Bright dipping	13
Buffing or polishing	31
Chemical conversion coatings	9
Electropolishing	4
Plating	13
Scratch brushing	10
Tumbling	19
Other	4

How High Are User Inventories?

DAYS' SUPPLY	COMPARED WITH A YEAR AGO
13% Less than 15	20% Are Higher
20% 15 to 30	
42% 31 to 60	8% Are Lower
19% 61 to 90	
6% More than 90	72% Are Same

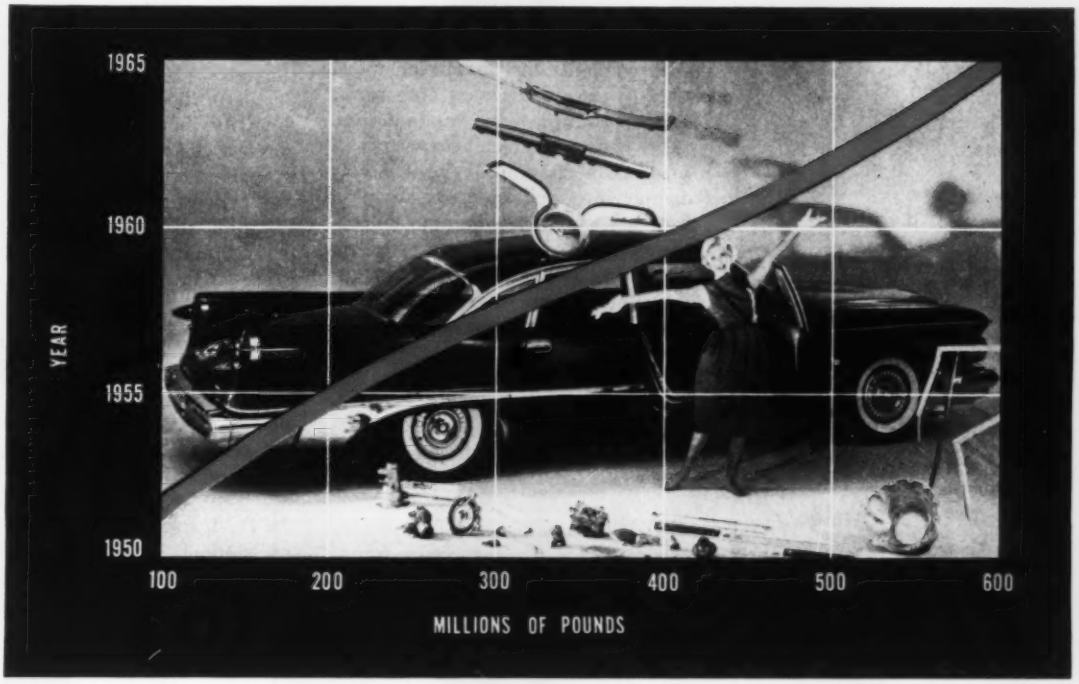
Castings, Sheets Most Widely Used

(Per cent using each form)

Castings	59%
Sheets (other than brazing)	55
Bars	44
Extruded shapes (except structurals)	44
Tube (drawn)	40
Rods	35
Plates	30
Coiled sheets	26
Structural shapes	21
Welding wire	20
Pipe	16
Foil	13
Forgings (die)	13
Tube (welded)	11
Wire	8
Ingots	8
Forgings (hand)	6
Impacts	5
Sheet (brazing)	5
Pig	4
Electrical conductor cable	3
Anodes	2
Powder	2
Rerolled stock	2
Shot, notched bar	1
Extrusion billets	1
Forging stock	1
Other	2

USES

AUTO MARKETS hold vast potential for aluminum. The '59 Imperial (behind trend line) uses about 100 lb in 39 applications—about double average per car usage today



THE BUILDING industry is the largest consumer of aluminum today and will continue to lead the pack for years. Uses are spiraling, in the home, on the farm, in office buildings and factories, in highways and bridges.

Customers specify aluminum because of its appearance, corrosion resistance, lack of maintenance, and weight savings.

• **Homes**—This is the market with greatest potential. Around $19 billion will be spent on new home construction and another $6 billion to $7 billion on remodeling and modernization this year. Of the 3000 items that go into a home, it's estimated 79 per cent could be made from aluminum. Examples: Windows and doors, flashing, gutters and downspouts, vented gable ends, hardware, railings, heating and air conditioning ducts, roofing, shutters, siding.

National Homes Corp. has introduced a line of houses that uses 1500 to 3000 lb of aluminum in over 30 different applications.

• **Buildings** — At least 70 office buildings around the country employ aluminum curtain wall construction. Going up now in New York City are the Chase Manhattan Bank head office, which will use over 1750 tons of etched anodized aluminum; and the nine-story Fashion Institute of Technology building, which will feature 12 ft square panels fabricated from brown and gold anodized aluminum.

While all-aluminum buildings are glamorous, there's a bigger potential in such applications as: Store and building fronts, sashes, facing moldings, elevator cabs, doors, marquees, and ornamental uses. Seaporcel Metals Co. sees a growing market for aluminum porcelain enamel building panels, columns, and ventilation louvers.

Other uses: Lighting standards, sign supports, chain link fence, posts.

• **Bridges**—This market could become one of aluminum's brightest stars. Several new bridges of conventional design use aluminum structurals in place of steel. Two bridges designed for aluminum are on the market. Conventional steel bridges are using increasing amounts of aluminum in gratings and railings, lighting standards, inspection walks. The Greater New Orleans bridge utilizes 600,000 lb of aluminum in this manner, Philadelphia's Walt Whitman span, 1 million lb.

Automotive

Aluminum stands on the threshold of major new uses in this market. The amount in the average car rose from 25 lb in 1954 to 47.2 lb

CONSTRUCTION is aluminum's No. 1 market. The metal is finding widespread applications in homes, office buildings, stores, plants, skyscrapers, bridges, and highways

last year. This year it's 51.6 lb, says Aluminum Co. of America.

• **Almost Here**—Coming are such major applications as engine blocks, heads and crankcases. The first aluminum engine (six cylinders, air cooled) will be seen in Chevrolet's light car due out in September.

Other developments include the much talked about transaxle which is expected for limited use on larger GM and Chrysler lines in 1961. It will combine the aluminum now used in the transmission and transmission housings with an aluminum axle housing which presently is made from cast iron. Wheels, brake components, and bumpers are also expected to go to aluminum during the next five years. Impact extruded aluminum is expected to return for functional items like transmission reaction shafts, reverse servopistons, and sparkplug tubes.

• **Decorative**—The metal has about realized its potential in decorative applications. Two untapped areas are wheel covers and hub caps.

• **Today's Auto Uses**—They include: Housings for items such as transmissions, torque converters, and other power train components; transmission components like stator wheels and valve bodies; fuel pumps, carburetors, distributor pumps, horn mechanisms, pistons, and brake drums. Typical trim items are grilles, headlight bezels, side moldings, window frames, and embossed interior and exterior body panels.

• **Trucks** — The trucking industry has used aluminum for semitrailer construction a long time. Recently, GMC Truck & Coach Div. introduced an all-aluminum truck. Other makers are using more of the metal.

Heavy duty trucks and trailers consumed 23,500 tons of metal in 1958 (1959 estimate: 28,500 tons).

• **Mobile Homes** — Here's another growing field. The market will take about 30,000 tons this year for such applications as siding and roofing, hardware, structural framework, and trim items. Consumption could double in the next few years.

• **The Market Place**—Zinc, stainless steel, and cast iron will continue to be competitive in the auto market. Magnesium and plastics may become major competitors in the next few years.

Aircraft and Missiles

The amount of aluminum going into aircraft has dropped sharply in recent years because of the switch in defense emphasis. But it's still one of the principal structural materials going into aircraft.

Missiles have taken up some of the slack. It's believed that every missile in the nation's arsenal makes some use of the light metal. Examples: Convair's Terrier and Tartar missiles take 75 to 100 lb per unit. Booster components in the Corporal take 4000 lb of sheets, plates, forgings, extrusions, and castings.

• **Aircraft**—Here are some current uses in manned aircraft: North American's T-39 jet trainer employs 4624 lb (77 per cent of the empty airframe weight). Douglas says 80 per cent or more of the metal it uses is aluminum. Martin employs 52,000 lb in the P6M, 30,000 lb in the P5M, and 3400 lb in the TM-76.

• **Trend** — Manufacturers unanimously agree uses won't increase. Says one builder: "In nearly every instance involving a future aircraft or missile airframe, the expectation is that the use of aluminum will steadily decrease due to the higher operating temperatures occasioned by supersonic and hypersonic flight."

Convair is trying to expand the useful temperature range with coatings and insulations. "However," says the company, "the higher range of temperatures possible appears to be limited."

Present missiles are adaptable to aluminum-steel combinations, but it is seen as a transitory period. Even in jet passenger aircraft, stainless steel, magnesium, and titanium are expected to replace aluminum although the amounts on present products won't be changed. Plastics are taking away some of the market in small aircraft.

• **Still a Market** — The metal will never be ruled out entirely. It will have useful applications inside a vehicle where it can be shielded from high exterior temperatures.

Marine

Steady, but not spectacular, growth is predicted in pleasure boats, motors, and ocean vessels.

• **Boats**—Since World War II, aluminum has been the major construction material in 600,000 outboard boats, several yachts and fishing boats, and an experimental tugboat. The pleasure boat market still offers a lot of room for growth. Where aluminum is used, it's the dominant material: Viking Boat Co. says its boats are 99 per cent aluminum; Aluma Boat Co. gives a figure of 85 to 90 per cent.

Plastic boats are making gains. Comparisons: 120,000 aluminum boats were produced in 1957 vs. 50,000 plastic; last year the figures were 115,000 aluminum, 72,000 plastic. Some makers believe the trend to plastics has about ended.

• **Motors** — Evinrude Motors uses from 3 lb of aluminum in its 3 hp outboard motor, to 111.81 lb in its 50 hp unit. Another motormaker uses 2 to 60 lb per unit.

• **Ships**—Ocean-going applications have been mainly confined to Navy ships. *USS Kitty Hawk*, a carrier, takes 233 tons; the *Little Rock*, a cruiser, 154 tons; and three new guided missile destroyers take 170 tons each, reports the builder, New York Shipbuilding Corp.

The metal is used mainly to save weight and because it's easy to maintain. Some uses: Superstructures, joiner bulkheads, shelves, bins and racks, smokestacks, masts, ventilation ductwork, radar towers, gratings, and some floor plates.

The trend toward substituting aluminum for steel in Navy ships has about reached its peak. Reason: New missile systems require greater rigidity of structure and greater resistance to blast conditions than are practicable with aluminum. But merchant ship owners are beginning to specify aluminum in areas where steel was formerly used—mainly due to new welding techniques and new high strength alloys.

Railroads

The metal has made some penetration in this field, but it hasn't captured many large poundage uses.

Aluminum companies have pioneered several uses which they hope will receive widespread acceptance. For example, Aluminium Ltd. has delivered four, all-aluminum refrigerator cars to the Canadian National Railways. Reynolds Metals Co. has developed a boxcar lining made of extruded panels to protect car walls against wear (it's being tested by the B&O). Several all-aluminum freight and ore cars have been built.

• **In Use**—Here's the major use today: The New York Central System utilizes it in passenger car interiors and in specialty items because of its lightness and appearance. It uses some of the metal in roofs for boxcars and cabooses and is studying aluminum doors for freight cars. Alco Products Inc. uses 600 to 800 lb of castings and forgings in diesel engine covers and pistons. Electro-Motive Div. of General Motors Corp. uses small amounts in the conduits, engine blowers, cooling fans, and engine top covers of its locomotives.

• **Trends**—More builders are showing interest in the aluminum freight car. Some believe applications may extend to locomotive chassis components. But GM reports a trend toward less aluminum because of cost and certain corrosion problems; the NYC says laminated plastics are replacing the metal in many interior panel and partition applications in passenger cars.

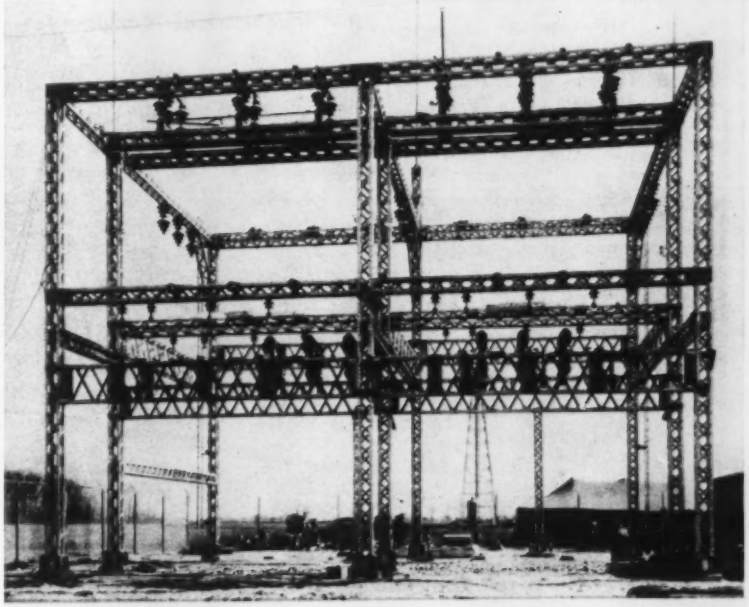
Outlook: Moderate growth.

Electrical

This market chewed up 234,000 tons of aluminum last year, but many think it's only the beginning. Forecast: By 1975, aluminum in power generation and transmission will show a fourfold increase to 1 million tons—perhaps more.

• **Where**—Probably the most important single application has been ACSR cable. It has captured better that 90 per cent of the overhead, high voltage, power transmission market. The metal is also taking over a large share of the overhead distribution and service drop business. It's used as a sheath in co-axial cables and as a braid in Navy and co-axial cables.

• **Future**—The potential is enormous. Electrical industry executives estimate the U. S. will generate 1.3



ELECTRICAL FIELD is expected to be second fastest growing market over next few years. Prefab substation above is one new use

trillion kilowatt-hours in 1968 and 2.1 trillion in 1975 vs. 1958's 645 billion. This means increased demand for electrical wire and cable products and use of more aluminum-sheathed cables and multitube assemblies employing aluminum tubing.

Wire and cable makers say there is a trend toward the metal as a substitute for: Lead sheathing, copper conductors in certain cases, and other metals that do not satisfy the environmental or installation conditions.

So far, it hasn't been economical or technically practical to make wide scale use of aluminum cables underground, and many believe the metal will never grab much of this market. But if anodized aluminum strand can be produced economically, the way may be opened for a large usage in underground cables. Use of polyethylene insulation in place of paper on underground cables in voltages up to 35 kv may open a new field for aluminum sheaths.

• **Other Uses**—More applications are being found in bus conductor, switchgear, wavetraps, magnet wire, and many other electrical products. Aluminum wiring for houses is being researched, but few expect a big market in the foreseeable future.

Electrical conduit is booming. Aluminum people are predicting they'll get 75 per cent (or 300,000 tons) of the 400,000-ton-a-year market by 1965 by selling users on greatly reduced weight, easier handling, and installation.

Aluminum transmission towers offer real potential. A number are already on order. Advantages cited: Elimination of maintenance painting, ease of erection.

Electrical Machinery

Here are some examples of the metal's status in this market:

• **Motors** — Builders of fractional horsepower motors report usage of 1 to 6 lb per unit. The average: About 2 lb. The metal is generally found in end frames, rotors, and fans. In larger units, poundage varies all over the lot—a 50 hp, alternating current motor contains 20 lb. Most builders believe uses will continue to grow.

Often mentioned as having greatest potential: Aluminum windings and magnet wire.

• **Generators**—General Electric Co. uses 5200 to 7000 lb of aluminum per unit in terminal plates, windings, wedges, sand blades, and flanges on bushings. It's employed because it's light, nonmagnetic, easy to cast. Jack & Heintz Inc. says average aluminum content in its generator is 20 per cent.

Nonelectrical Machinery

Aluminum predominates in a few pieces of equipment, but smaller applications make this the metal's sixth biggest market.

• **Machine Tools**—Builders use aluminum in head covers, drives, sheaves, belt guards, limit switch stops, safety stops, cam doors, handwheels, and drives. It's used where weight can be saved, particularly where inertia is important.

• **Lift Trucks**—Makers list limited poundages in these applications: Brake wheels on armatures, brake shoes, diecast transmission covers, sand cast control boxes, frames.

• **Cranes**—The all-aluminum industrial crane opens a new market that could consume thousands of tons of metal a year. Manufacturers say the units offer increased capacity without costly modifications of craneways and supports. Kaiser Aluminum says, generally, capacity can be increased 25 to 30 per cent over comparable steel cranes without upping wheel loads.

• **Others**—Chicago Bridge & Iron Co. employs 5000 to 400,000 lb of aluminum per unit in its line of tanks. The company reports a trend toward substituting aluminum for stainless because of cost.

Containers and Packaging

Booming is the only way you can describe this market—the fifth biggest consumer. Forecasters believe it'll grow faster than any other market in the next six years.

• **Where**—Any supermarket will give you an idea of what's at stake.

MARINE USES continue to make great strides. Boat pictured weighs 530 lb—more than 80 per cent of it is aluminum. The **USS Kitty Hawk**, a carrier, took 233 tons of the metal

MODERN ARMIES require vehicles that can be transported by air and dropped by parachute. So the light metal has a vast potential here. Armor on tank is made of aluminum

Rigid foil containers are an even bigger market than wrappers. Consumption last year set an all-time record of 18,500 tons. The frozen food and baking industries are two big customers.

The 1-billion-unit collapsible metal tube market used up to 8.2 million lb of the metal last year. Look for steady expansion here.

• **Real Tonnage**—The siege guns are being aimed at the 41-billion-unit-a-year can market. All-aluminum cans are already a reality. At least one major beermaker has switched over from tin plate. National Can Corp. is making a 1 quart motor oil can for Esso Standard Oil Co.

Surveys indicate aluminum could capture 5 per cent of the can market in the next two to four years and might win up to 20 per cent in the next ten. Aluminum people think annual consumption of 200,000 tons within a few years is a reasonable target.

Appliances

Applications appear to be gradually rising. The trend is away from aluminum in certain units, but it is more than offset by gains in other products.

• **Radio, TV**—These uses are small and don't show any signs of accelerating much in the next few years. A Chicago maker uses the light metal for decorative trim and electrolytic capacitors (made of foil). The firm is experimenting with anodized aluminum for cases and decorative trim.

Radio Corp. of America puts about 1 lb of aluminum screw machine parts, stampings, and castings into its average TV set; about 0.5 lb goes into its clock-radio.

• **Air Conditioning**—Carrier Corp. is increasing its usage at the expense of copper and steel.

Its reasons: Price stability, favorable weight factors (which save on transportation charges), and heat transfer qualities.

Typical Carrier products take 8 to 100 lb of foil, castings, sheets, and tubes.

• **Ranges**—Philco Corp. uses an average 3 lb of sheets in its line of kitchen ranges—chiefly in decorative panels and drip pans. Per unit use is expected to increase (partially at the expense of other materials) mainly because "aluminum's reflectivity is superior."

• **Washers and Dryers**—Aluminum is found in trim, controls and burners (gas units), gear case covers, escutcheons.

Speed Queen uses about 16 lb per unit; Whirlpool Corp., 1.5 to 2 lb; Norge Div., Borg-Warner Corp., 1 to 12 lb.

Consensus: Usage will increase.

• **Other Appliances** — RCA uses 2.318 lb in seven applications in its stereo tape recorder.

Of the 800 lb of material in heavy duty pressure cookers produced by the Cleveland Range Co., 50 lb are aluminum. Small models take 10 lb of sheets, tubing, and castings. The company expects the poundage to hold fairly steady.

Cooking Utensils

Of the 100 million or so kitchenware items manufactured in the U. S. each year, about 45 per cent are aluminum. It's doubtful that the percentage will change greatly. Many of the nation's 28 makers report new plastic and stainless

Who Uses Aluminum Products

STEEL surveyed 3000 metalworking companies. More than 71 per cent of the respondents make products containing aluminum. Here are their customers:

36.5%	Aircraft & missiles industry
25.7%	Electrical & electronics industries
24.7%	Users & makers of defense equipment (other than aircraft & missile makers)
21.7%	Automotive industry
21.6%	Construction industry
16.2%	Appliance & utensil industries
14.5%	Machinery (nonelectrical) industry
8.9%	Marine industry
8.6%	Machinery (electrical) industry
7.4%	Container & packaging industry
41%	Other industries

steel applications which will step up competition.

Producers buy sheets, coil, wire, tubing, extrusions, castings.

Atomic Energy

No significant new applications of the metal are expected in this field. The limiting factor will be the number of reactors and other atomic installations built.

• **Potential**—But the market could be significant tonnagewise. For example, General Electric Co. says 75 per cent of the components in research and test reactors contain aluminum alloys. A swimming pool reactor at Plainsboro, N. J., is housed in an 87 ft dome entirely fabricated from aluminum.

Use is limited in power reactors because the metal doesn't hold up to extreme heat. But in some areas it can be employed in much the same manner as in a conventional power installation. Examples: High purity water handling systems, heat exchangers, condensers.

Oils and Chemicals

The petroleum and chemical processing industry consumed 25,250 tons of the metal in 1957. Predictions are it will take 48,500 tons yearly by 1960 and eventually over 187,000 tons yearly. Major uses: Chemical drums, tanks and vessels, process pipe, heat exchangers, jacketing, structurals. Biggest potential is in tanks and vessels which some think could become a 100,000-ton-a-year market.

• **Booming**—Oil drilling and production is another growth market. It took only 5700 tons of aluminum in 1957, but estimates peg 1960 consumption at 47,000 tons and potential yearly consumption at more than 72,000 tons. Uses include oil country pipe, offshore drilling platforms, drilling structures, tubular goods, drilling tools. Biggest potential: Pipelines, followed closely by offshore drilling platforms.

• **The Largest**—The future for aluminum in chemicals is even brighter. The market took 28,000 tons in 1957. Industrymen expect consumption to hit 48,000 tons next year, then soar to 196,000 tons within a few years.

Deoxidizing

Steelmakers use about 0.25 lb of aluminum (per ton) to deoxidize rimmed, capped, and semikilled steels. If 110 million ingot tons of steel are made this year, aluminum consumption will be more than 13,750 tons. In addition, about 5 per cent of the ingot output will be killed steel—averaging 1.25 lb of aluminum per ton. Aluminum consumption in a 110-million-ton year figures about 16,500 tons.

No recent developments suggest more extensive use of aluminum. Observers believe any increase will be in proportion to the growth of the steel market.

Business Machines

Widespread applications are found in computers, typewriters, duplicating and accounting machines, and other types of equipment.

• **Amount** — Royal McBee Corp. uses 3 million lb per year in its equipment. Burroughs Corp. employs some 300,000 lb per year—about 3 per cent of all materials consumed. Here are some of the applications in Remington Rand's equipment: Univac I has ten uses accounting for 5390 lb; Univac II, 13 uses—4745 lb; new Univac computer, four uses—1250 lb.

• **Trend** — International Business Machines Corp. looks for a moderate gain in decorative trim applications. Burroughs sees a slight trend toward substituting diecast aluminum for sheet metal cases. At the other extreme, Royal McBee reports replacement of aluminum with plastics and zinc diecastings. Remington Rand also sees a trend toward the use of less aluminum in certain areas.

Defense

The military market remains one of the primary potential outlets.

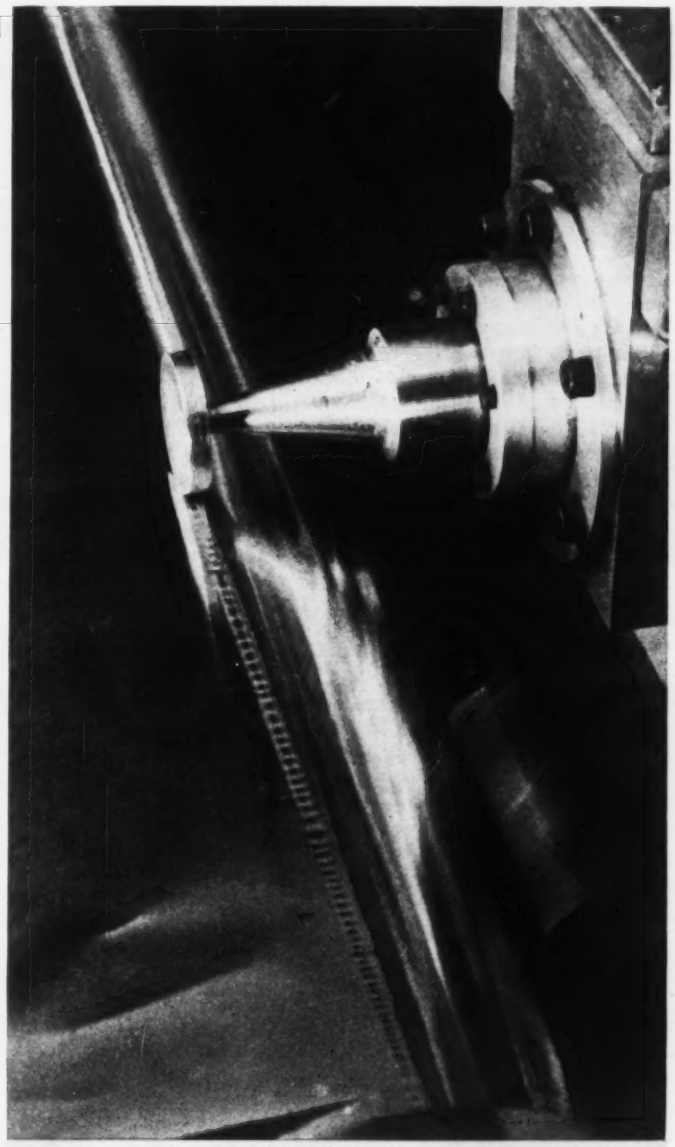
Under development by the Armed Forces are these predominantly aluminum items: A wide range of vehicles, bridges, shelters, pipelines, armor plate.

Our new defense look requires vehicles that can be easily transported by air and dropped by parachute. This spells aluminum.

General Electric Co. says aluminum comprises 50 to 75 per cent of these military items it makes: Radar antennas, trailers, missile handling equipment, electronic cabinets, and guidance packages.

FABRICATION

A new technology of fabricating methods has grown up around the light metal. Most promising: Casting, extrusion, explosive forming, and welding



ULTRASONIC SPLICING of aluminum foil at Alcoa is done by this small roller which vibrates at 50,000 cycles per second

ALUMINUM is undergoing a flourishing evolution as a basic material. Much of its success is directly attributable to developments in fabricating techniques.

Producers and users have come up with new ways to form products by casting, extruding, and explosive forming. New techniques in welding have made the metal a valuable structural material for tanks, bridges, and even concrete mixers. New methods of finishing have contributed to its success in architectural uses, automotive trim, and similar applications.

Casting

Diecasting seems to be the comer in this field. A lot of attention is being given to aluminum-silicon alloys (containing from 15 to 30 per cent silicon) for automotive engine cylinder block production. Reason: To gain resistance to wear.

Means of modifying the hypereutectic alloys with phosphorus have been perfected to gain finer particles of silicon and improved machinability. The advantages of low coefficient of expansion, good wear resistance, and good castability make the aluminum-silicon alloys a natural for engine parts, including the cylinders themselves, or liners for the cylinders, brake drums, and pistons.

Spray coating of the alloys on the cylinder walls (cast of an established commercial aluminum alloy) could be an alternate approach.

More extensive use of aluminum transmission housings can also be expected.

Authorities close to the automobile industry say parts of General Motors' small car engine will be diecast aluminum. Chrysler has bought one of the largest diecasting machines ever made. Ford is apparently the least involved with an aluminum diecast engine. Even so, the company has opened a 220,000 sq ft building which converts molten aluminum into 67 different parts for use in engines and transmissions.

Trucks carry the molten aluminum over a 1/4 mile private road from a Reynolds Metals Co. plant to the Ford foundry at Sheffield, Ala.

Diecast V-4 blocks are coming off the line at Johnson Motors Div., Outboard Marine Corp., Waukegan, Ill. Cast iron cylinder sleeves are

ALUMINUM CONCRETE MIXERS were developed by Kaiser Aluminum & Chemical Corp. with Construction Machinery Co. They're mounted on International truck chassis

used. A large manufacturer of diecasting machines expects the first diecast, six-cylinder engine blocks to be produced this year; mass production is slated for '60 or '61.

More automation in diecasting is coming. Automatic ladles, a must on large machines, will be favored more on medium size machines. Cost reduction and greater uniformity of diecasting quality will be attained by gradually eliminating the variables caused by the manually controlled portion of the casting cycle.

The vacuum diecasting process has not proved to be the cure for all problems, but it has been helpful in many instances, and interest in the process is still keen.

Aircraft frame manufacturers are showing more interest in premium strength castings. They will also be used in other areas where their higher tensile properties will permit weight reduction. They may be specified to reduce machining costs, and high dimensional precision may be required in cast parts for satisfactory performance.

A market is developing for ornamental castings that can be anodically coated. Applications will include automotive trim or hardware and household hardware. Such castings (made by the diecasting or permanent mold processes) are becoming commercially available.

Further development of the relatively high purity grades of diecasting and permanent mold alloys will contribute to lowering the cost of making parts for consumer durables and those requiring high reflective finishes. The new alloys can be chemically brightened to a luster that has been heretofore possible only through mechanical buffing.

Extrusion

Harvey Aluminum Inc., Torrance, Calif., is producing large, heavy press extrusions in solid and hollow shapes, panels, and tubes in unprecedented sizes, lengths, and configurations. Principal user: The missile industry.

Adolph Coors Co., Golden, Colo., recently revealed the development of a process for turning aluminum pig into 7-ounce beer cans via a casting wheel, rolling mill, and extrusion press. The setup provides extrusion slugs at a cost low enough to permit the can to be competitive with conventional tin plate types. The automated line meets volume needs, is reliable and economical to run.

Coors actually has two production lines in one. The first converts aluminum pigs into extrusion slugs; the second transforms the slugs into cans, ready for filling.

One feature: Continuous casting of strip. Molten metal is poured onto a "casting wheel." Its complex design is the secret to the company's ability to cast the thin, relatively wide strip.

The strip is rolled to size on hot and cold rolling mills, then blanked into slugs on a stamping press. After annealing, the slugs go into two German-built presses that extrude 3600 flat-bottomed, seamless cans an hour.

Coors spokesmen feel that aluminum can be reasonably competitive with tin plate only if the food or beverage processor is willing to make his own cans.

The most recent development in extrusion is Aluminum Co. of America's lateral impact. It provides designers with new shape possibilities. Complex parts like faucet handles and the hub and spokes of a steering wheel can be formed instantaneously with one push of the press ram.

"Lateral" refers to the direction of metal flow. Other impacts are made by making metal flow up around a punch, down into a die, or a combination of the two movements. In lateral extrusion, metal flows outward at any angle from the direction of the impact stroke.

The company proved the process by designing a part similar to an automobile steering wheel—a formed hub with three spokes extending from it. It's made in one operation, cold, from a cylindrical slug.

Impacts have long been preferred where wrought strength and close tolerances are desired for products with intricate design. They are most frequently parts with solid ends.

The process is being used frequently for operations that are beyond the abilities of other metalworking methods.

Explosive Forming

The latest, most spectacular method is explosive forming (some call it high energy rate forming). Practitioners use the female half of a die, clamp the blank to it, submerge it in water, and detonate a measured amount of explosive. The result: A formed part, almost instantaneously.

Advantages, say proponents, are: Low capital investment (you don't need a press); die materials for short runs can be inexpensive, such as plastic (one outfit even uses a concrete die with some success); significant reduction or elimination of springback; and easy handling of the tough, hard alloys.

Alloys 1100, 2014, 2024, 3003, and 7075 are among those being explosively formed in both annealed and hardened conditions; thicknesses range from foil to 0.75 in. plates.

Explosive forming can be used to produce dimples, one of the simplest and oldest applications, and to pierce metal with no cracks in the edges of the adjacent metal and with virtually no burring. Other applications: Forming hollow inlet vanes, fan hubs, dished parts, bulged tubing, swaged parts, and embossed designs.

Forms other than sheets also show considerable promise. Forgings could be done with rather simple equipment or at pressures exceeding those of the largest forging press in use. High energy rate methods could use rams to transmit forces for the extrusion of metals. It has been applied to compact powder into discs and may be developed for compacting of ceramics, powder metals, and cermets.

In casting, high velocity flow of materials could fill back cavities before the metal is chilled by the cold walls of the molds and could be used to produce thinner sections and more complicated shapes.

Although much of the interest in the method is expressed by the aircraft and missile industries, other industries will probably adopt it soon. Autodom could use it for limited production of truck and auto bodies. Manufacturers for the chemical and petroleum industries may find it valuable for economical production of tanks, tank ends, towers, and other equipment involving large shapes.

Joining

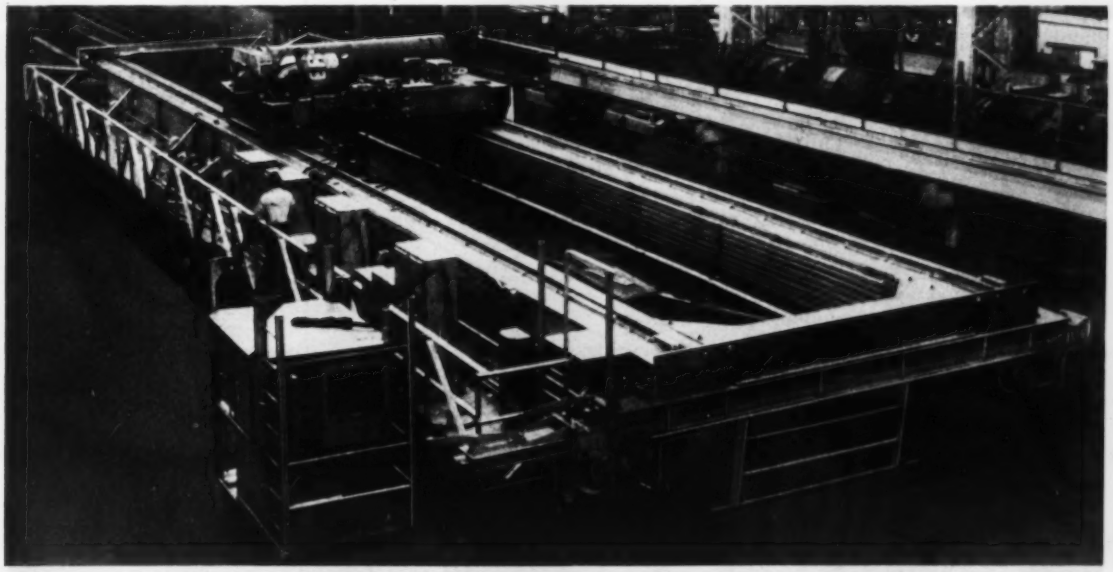
Within the last few years, a new welding technology has developed around aluminum and its alloys. All producers supply special alloys for welding. They include aluminum-magnesium-manganese and aluminum-lithium combinations. Joints are strong, ductile, and easy to make.

Kaiser Aluminum & Chemical Corp. has developed three methods involving the additions of halides (chlorine and fluorine) to the shielding gas.

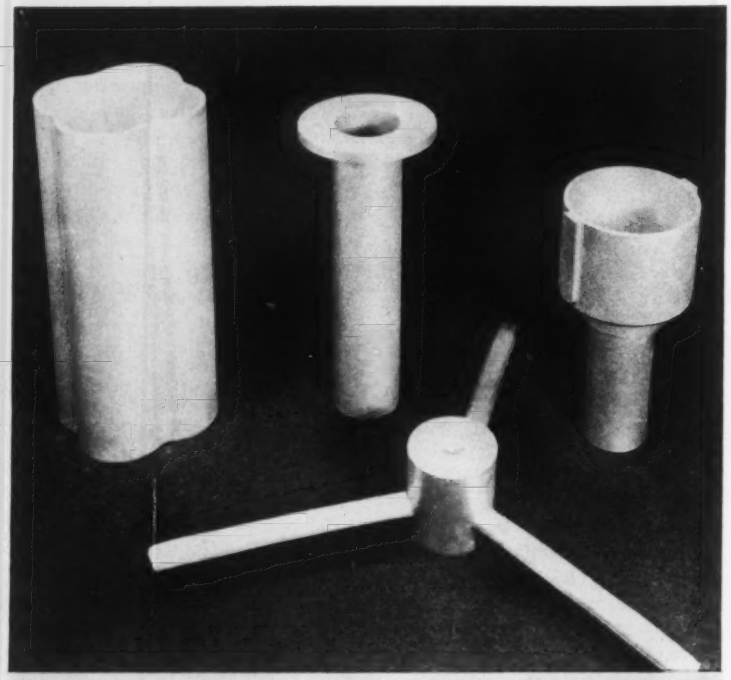
The 5000 series (aluminum-magnesium) alloys work well with the conventional, consumable arc, inert gas shielded method. A technique developed by Linde Co., a division of Union Carbide Corp., New York, will buttweld 1 in. plates in two passes; no edge preparation is needed.

The combination of the 5000 series and welding has made possible such structures as large storage tanks for corrosive chemicals, highway trailers, ship superstructures, and highway bridges, says Alcoa.

Kaiser points to all-aluminum, welded overhead cranes that are being built for the Navy. Aluminum concrete mixers made from weldable alloy 5086 are coming off the production line at Construction Machinery Co., Waterloo, Iowa. The



OVERHEAD TRAVELING CRANE built by Harnischfeger Corp. for the U. S. Navy was made possible by new welding and cutting techniques. All structural parts are aluminum alloy



LATERAL EXTRUSION (lower right) gives designers new shape possibilities. Conventional impacts (reverse, forward, combination) are at top

units weigh one-third less than steel models of the same size. That means increased payload, fewer trips, and savings in time, labor, fuel, and maintenance.

Extensive field tests show that the sand and gravel don't wear the aluminum mixing paddles any more than their steel counterparts.

Another example of the metal's utility is an experimental freight car door being tested by Pullman-Standard Car Mfg. Co., Chicago. The 9 ft door is made of a welded box section frame covered with an aluminum sheet which is glued to the frame with a thermosetting epoxy. The doors were attached to a Rock Island freight car and tested by running another 169,000 lb car into it (coupling) at speeds over 8 mph. Strain readings taken at critical points showed negligible stresses. The doors are now being tested for longevity.

Ultrasonic welding is another comer. Aeroprojects Inc., West Chester, Pa., has developed several devices which are being used for joining packaging foils, aluminum honeycomb for aircraft, thin foil terminals to heavy plates, and ends of foil traveling through a rolling mill. One user says ultrasonically spliced foil saves him $100,000 a year.

Joints are metallurgically sound, can be made inconspicuous enough to pass unnoticed under lithographing, and do not affect metal adjacent to the weld.

You'll see more use of the process as more powerful ultrasonic generators that handle heavier sheet stock are developed.

In adhesive joining, the limiting factor has been the strength of the joints at elevated temperatures. (Most adhesives are limited to room temperature use.) If temperature limitations were removed, adhesive bonding could make great strides.

Adhesives are being used extensively in bonding aluminum foil to paper or cardboard for packaging. The paper supplies the bulk of the strength; the aluminum seals against moisture and odors and adds sales appeal.

Finishing

Recent developments have been largely responsible for the rapid increase of usage in architecture.

An aluminum dome 200 ft in diameter with an anodized gold finish will be a major feature of the U. S. cultural and industrial exhibition at Moscow this autumn. The structure will be similar to the Kaiser Aluminum dome (145 ft in diameter) at Hawaiian Village, Honolulu.

A curtain wall of natural, gray, and gold colored alloy will be used on the Kaiser Center building at Oakland, Calif.

Styling engineers are using anodizing to provide more luxurious and beautiful interiors for commercial aircraft. Interior trim items such as ash trays, panels, lighting fixtures, air vent filters, window frames, moldings, and other hardware items are anodized in gold, gun metal, and other colors.

Various metals can be electrolytically plated on aluminum. A metal like zinc can be deposited, then used as a base metal on which to deposit other metals. Iron can also be plated on aluminum, making it possible to produce a soldering tip having excellent heat capacity and long life.

You soon may see some new finishes for the light metal. Alcoa cites these possibilities: Laminates such as melamine and videne; new textures and patterned sheets; new colored finishes that would give the metal a rich, grained appearance of fine wood; various shades of color in one sheet to give the appearance of marble.

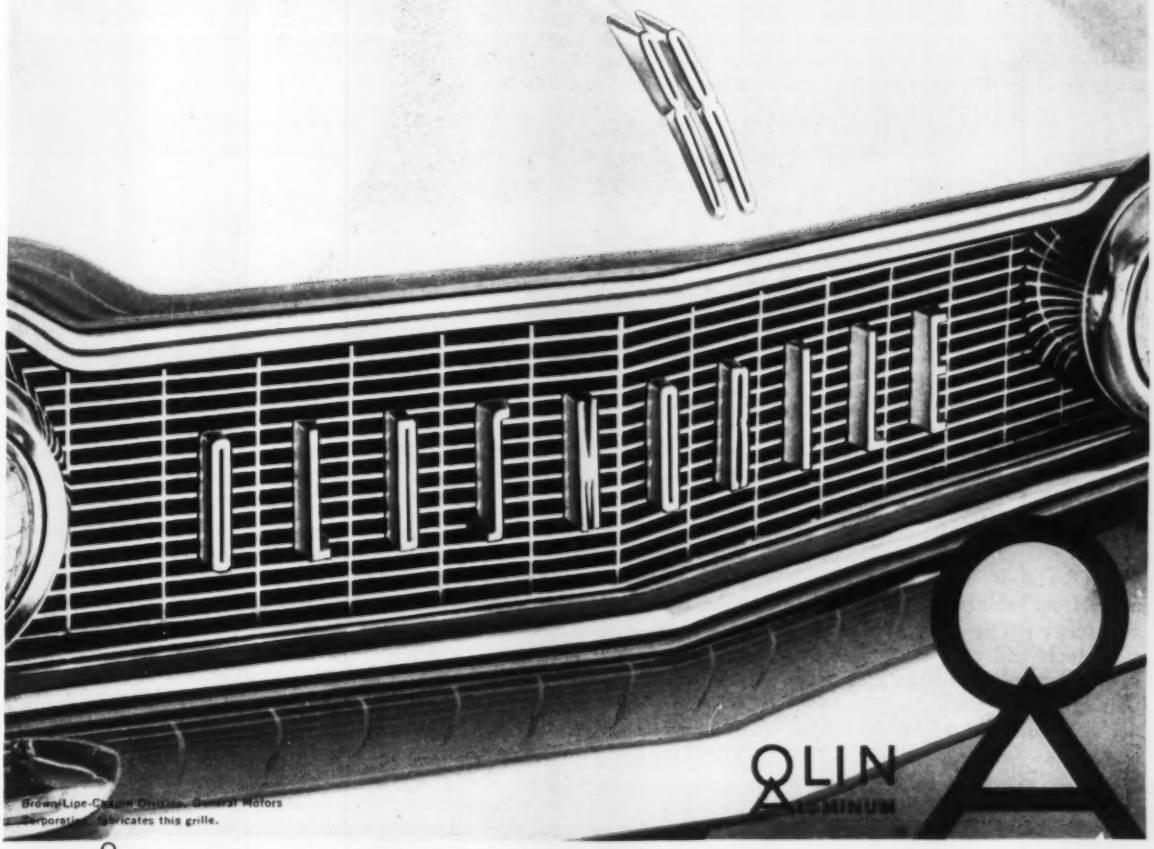
Other Processes

More emphasis will be placed on the manufacture and application of foamed aluminum, says Olin Aluminum Metals Div., Olin Mathieson Chemical Corp., New York. Applications of a suitably priced product would include structural and architectural components, shipping containers, and furniture. Development housing is expected to be a major market.

The tube-in-sheet process, such as Reynolds Metals' Tubed Sheet and Olin Aluminum's Roll-Bond, is assuming new importance. The processes allow a designer to create any pattern of tubing, however intricate, within a single, homogeneous sheet.

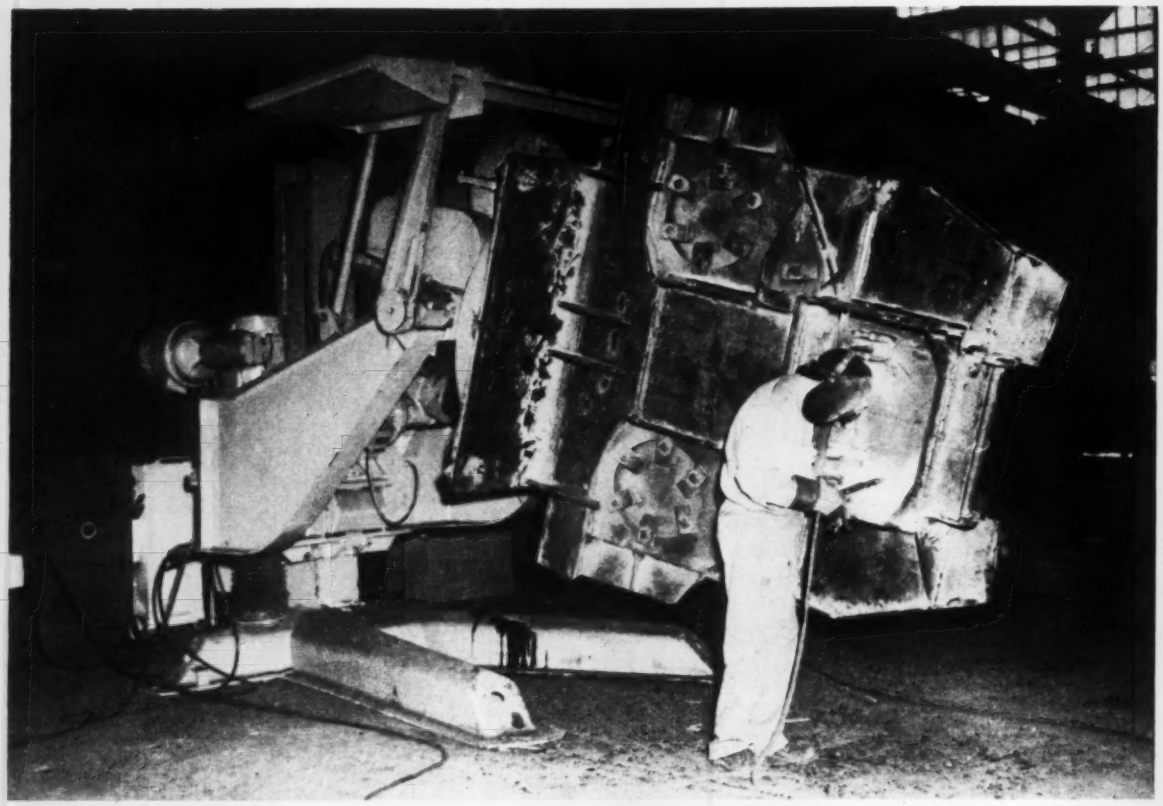
Aluminum powder metallurgy alloys are coming in for a share of attention for high temperature use, says Alcoa.

OLIN
ALUMINUM
GLISTENS
ON
AMERICA'S
FINE
CARS



Brown Lipe-Chaplin Division, General Motors Corporation fabricates this grille.

OLIN MATHIESON, METALS DIVISION, 400 PARK AVENUE, NEW YORK 22, NEW YORK.



Powerful positioner tilts, rotates, or elevates heavy assemblies for faster and easier welding. It's operated from the floor or an elevated platform

Positioner Cuts Costs, Improves Weld Quality

It increases output of large, awkward assemblies by boosting the welder's efficiency; he doesn't have to wait for a helper or crane to hold or move weldments

WANT more efficient performance from skilled workers? You can often get it by providing the right tools and equipment.

For example: A welding positioner reduced work time 20 to 40 per cent on large weldments at Jeffrey Mfg. Co., Columbus, Ohio, says Roy Mount, welding superintendent. The equipment was supplied by Harnischfeger Corp., Milwaukee.

• The positioner permits faster, safer work on large weldments.

The equipment handles a wide variety of sizes and shapes. After tacking, parts are attached to the positioner face plate. They aren't removed until welding is finished. That reduces work hazards and saves production time.

Weldments can be moved to any position. The operator does all welding from a natural position above the work, and uses faster electrodes.

Elimination of heavy lifting reduces operator fatigue; that makes for faster, safer work, and a better product.

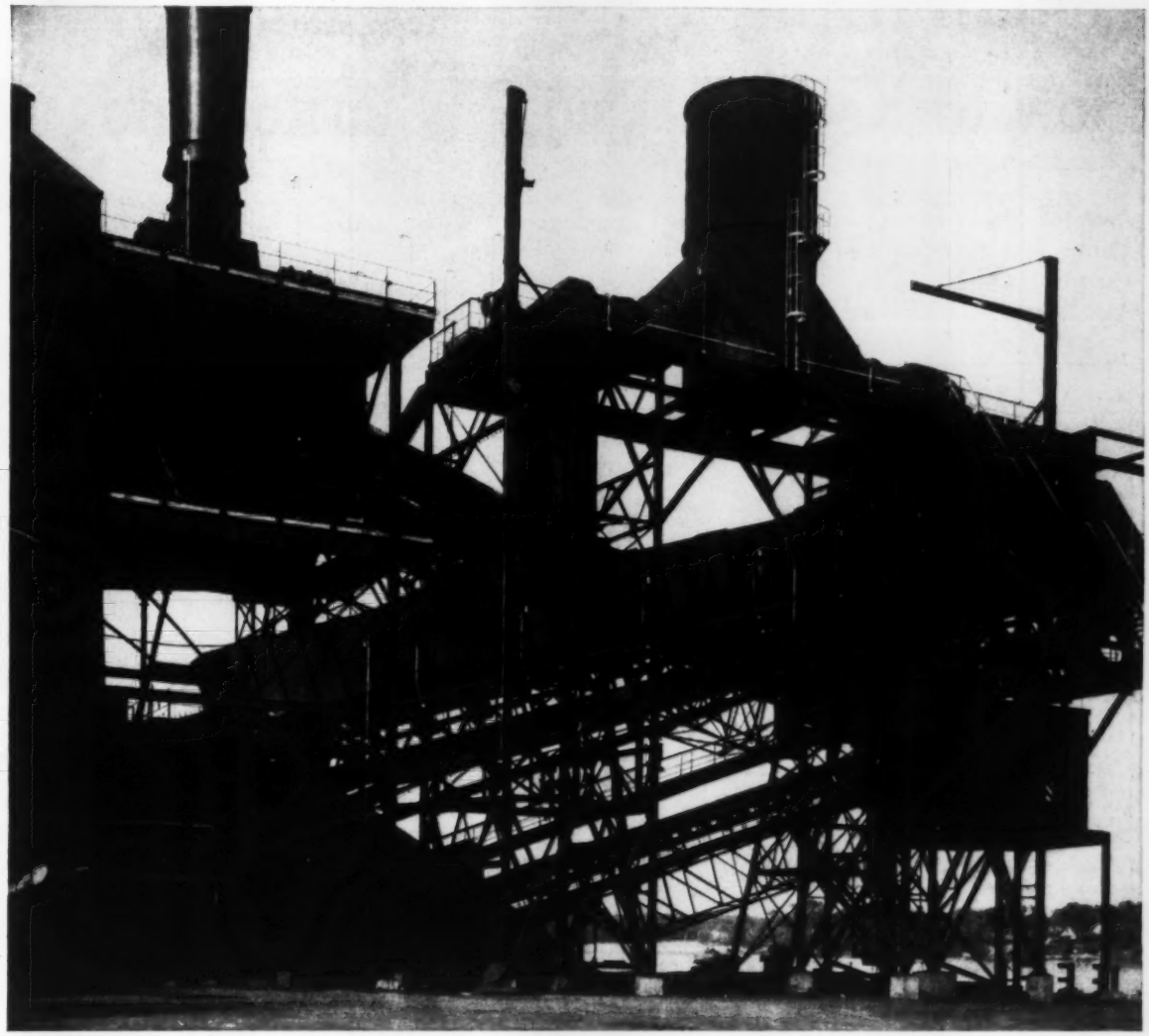
The positioner, with a capacity of 16,000 lb, makes heavy, complicated weldments easier to handle. Example: It saved over 10½ hours of welding time on the gathering head for a coal loading machine.

The part was formerly welded on the floor. A jib crane was required to hold and turn the head; a helper was needed every time the part was moved. The welder often lost work time waiting for a helper or crane.

• The operator can position work for most efficient welding, on or off the floor.

Most welding is done from the floor, but a self-leveling platform provides a safe, elevated work station when it's needed.

Using pushbutton controls, the welder can tilt, rotate, or elevate the weldment without leaving the platform.



sinter air-cooled and elevated at same time . . .
DRAVO-LURGI STRAIGHT LINE COOLER

Utilizing the air-cooling principle which delivers more *usable* tonnage, the Dravo-Lurgi straight line cooler raises sinter at the discharge end for storage in bins or for conveying. Output is increased by reduction of shattering and dust.

Where space permits its installation, the straight line design provides an extremely efficient method for both cooling and handling sinter. Here are some of the features which lead to maximum utilization of any sinter machine:

- No water quenching to cause shattering, cracking or brittleness.
- No need for plows or scrapers at the discharge end.
- Sinter is undisturbed during cooling—breakup is minimized.
- Sinter is elevated while cooling, facilitating loading.

A Dravo engineer will be glad to explain how Dravo-Lurgi coolers (either straight line or circular) can increase *usable* tonnage in your sintering operation. Write or phone DRAVO CORPORATION, PITTSBURGH 22, PENNSYLVANIA.

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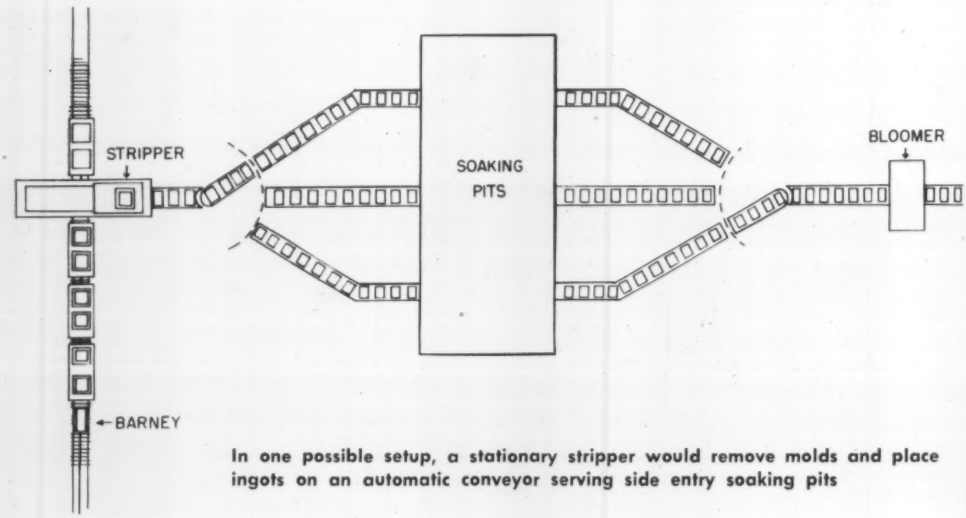
Blast furnace blowers • boiler and power plants • bridge sub-structures • cab conditioners • docks and unloaders • dredging • fabricated piping foundations • gantry and floating cranes • gas and oil pumping stations • locks and dams • ore and coal bridges • process equipment • pumphouses and intakes • river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

How to Keep Soaking Pits up to Date

Magnetic tape or punched card data storage systems would allow better inventory control and turn out more complete production records. Other benefits: Better scheduling, faster ingot transfer

By J. E. ORAM
Industrial Engineering Section
General Electric Co.
Schenectady, N. Y.



In one possible setup, a stationary stripper would remove molds and place ingots on an automatic conveyor serving side entry soaking pits

AUTOMATION can increase efficiency of soaking pits and boost production in the integrated steel plant.

Growing use of process control in steel producing and rolling areas should speed the modernization of ingot storage and heating facilities.

• In one proposed system, ingots would be stripped and identified, then taken to the soaking pits by an automatic conveyor.

It isn't necessarily the ideal system. But it's a step toward practical application of available control and data processing techniques.

A fixed position stripper would be located near the soaking pits. The operator would control a barney haul or conveyor to position the molds. After stripping each ingot, the operator would identify it by ingot number, heat number, and dimensions. He would learn from a master indicator which pit positions were open, and select a place for the ingot.

An automatic conveyor would take ingots to their places in a side entry soaking pit. Entry time and other data would be stored in a magnetic memory system.

If a side entry soaking pit is considered impractical or unrealistic, the soaking pit crane might be programed to move ingots to or from conventional top loading pits.

• Ingot control information would be available from the magnetic memory system.

When the soaking pit reached holding temperature and ingots were ready for rolling, information previously stored would be printed out in the blooming mill pulpit. Also recorded: Time at which holding temperature was reached.

The blooming mill operator or scheduler would have a record of ingots ready for rolling; he could select ingots and control their flow from the soaking pit to the mill.

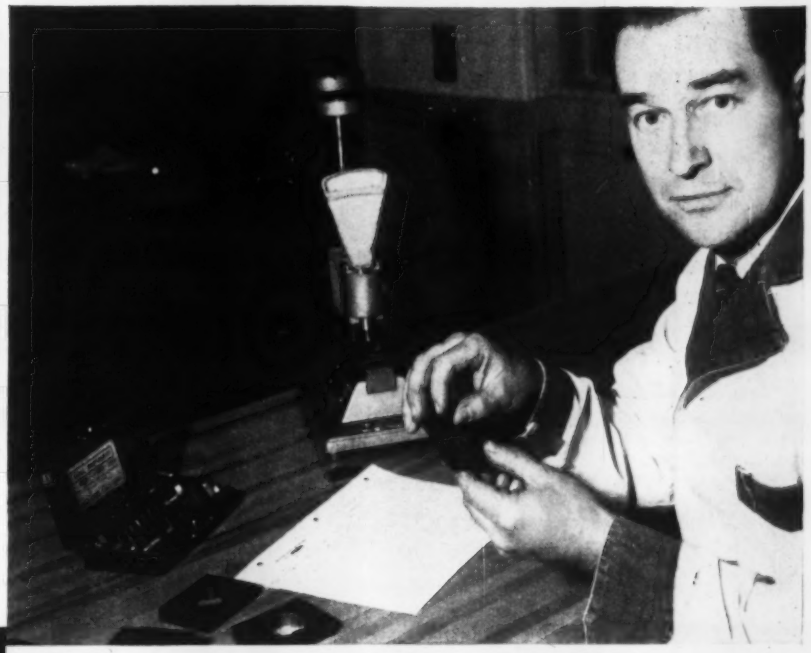
• Punched cards would identify ingots in the blooming mill or storage yard.

Because ingots don't always go directly into the soaking pit, provision would be made for bypassing the pits and sending the ingot to a storage yard. Description and location of the ingot could be recorded on a punched card.

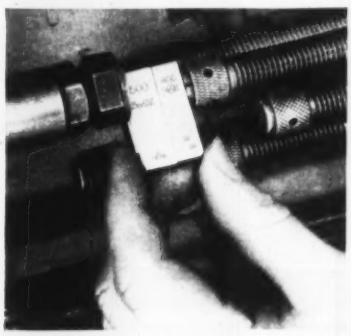
In mills controlled by punched-card programing, ingot identification data might be included on the mill program card.

NEW!

DoALL 56-R GAGE BLOCK SET



A single block can be used as either "go" or "not go" gage to measure this snap ring groove.



Gage blocks take the guesswork out of setting up automatic turret lathes and chucking machines.

Most Practical Set for Shop Use

More Useful Dimensions with Fewer Gage Blocks! The new DoALL 56-R set introduces a new concept in gage block usefulness by providing widely specified decimal and fractional dimensions that are not readily available in traditional sets.

Employed is a revised mathematical system that allows you to make common dimensions with fewer blocks—the first major improvement since the 86-piece set was introduced many years ago. In addition, this 56-piece set enables you to greatly reduce the time-consuming job of selecting, cleaning and wringing.

See How This Set Saves Time and Money

Ask your local DoALL gage specialist to show you how much easier, faster and less expensive it is to use DoALL's new 56-R set. The moderate price of the 56-R set makes it practical to assign a set to each of your toolmakers or machinists. This will eliminate the time waste created by a group working from the same set. They'll find the 56-R set has the most useful dimensions for setups, pre-production runs and shop inspection work . . . also stops rejects before they happen by reducing the risk of measurement transfer errors. Call your local DoALL Sales-Service Store or write:

Available in Three Grades		GAGE BLOCK SET NO. 56-R			
		.010″		(single block)—	.010″ series
		.020″	through .030″	(11 blocks) —	.001″ series
AA Grade	+.000002″—$490.00	.1001″	through .1009″	(9 blocks) —	.0001″ series
	−.000002″	.101″	through .109″	(9 blocks) —	.001″ series
		.110″	through .190″	(9 blocks) —	.010″ series
A+ Grade	+.000004″—$340.00	.100″	through .400″	(4 blocks) —	.100″ series
	−.000002″	1.000″, 2.000″, 3.000″		(3 blocks) —	1.000″ series
		1/64″, 1/32″, 3/64″, 1/16″, 1/8″, 1/4″, 1/2″, 3/4″		(8 blocks) —	Fract. series
A Grade (Shop-Blocks)	+.000006″—$240.00 −.000002″	.050″ or .100″ steel or carbide wear blocks optional			

GB-31

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The DoALL Company, Des Plaines, Illinois

NOW you can count on Chase for

ALUMINUM

as well as COPPER • BRASS • BRONZE • STAINLESS STEEL

CHASE IS ROLLING SHEET ALUMINUM

Chase as your source for aluminum gives you all these advantages:

LONG EXPERIENCE—for years, Chase has rolled aluminum for special applications, along with other metals. Result: excellent nonferrous metals experience that you can depend on.

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Most Chase warehouses are stocking Aluminum screw machine rod, bar and wire, cold heading wire in coils, general purpose tube in coils, and extrusions.

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- One phone call or inquiry covers your needs in five important metals.
- You get the benefits of ONE SOURCE supply—efficient quick processing of orders and one unified responsibility.
- Everything is made easier for you—credit arrangements, single-truck delivery, one billing and one payment.
- You can get reliable technical metals help on five metals from one source—and be sure of getting the metals you want when, where and in the quantities you need.

Talk over your requirements with your Chase District Office or warehouse today. Or write Chase at Waterbury 20, Connecticut.

Aluminum Sheet
From ½" to 18" width in 90 to 110 lb./inch coils

Mill Stocks of These 6 Alloys On Hand In
Waterbury and Cleveland Mean Quick Service

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5005	**5050**	**5052**

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BRASS & COPPER CO.
WATERBURY 20, CONN.
Subsidiary of
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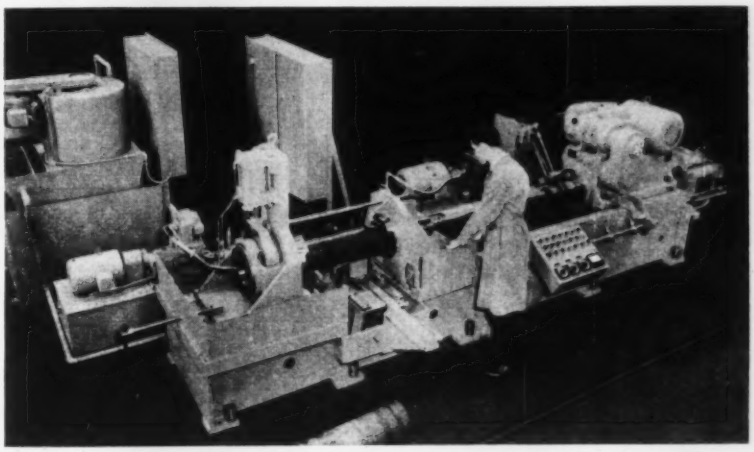
THE NATION'S HEADQUARTERS FOR **ALUMINUM • BRASS • BRONZE • COPPER • STAINLESS STEEL**
Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L. I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

Honing Machines Remove Stock Rapidly

HEAVY or rapid stock removal from large diameters and longer than average bores can be done with a line of heavy duty, horizontal Microhoning machines.

In an early application, a Model B-612 machine of the series is honing bores in oil well liners that are hardened to 64 Rockwell C. The bores range from 4.50 to 7.75 in. in diameter and up to 30 in. long.

A special feed unit, capable of exerting a thrust force measured in tons, makes possible the removal of 1.3 cu in. of stock per minute from the hardened steel liners.



Micromatic fixturing on this application embodies two workholding stations. This permits loading of a second part while the first part is being honed. A hydraulic mechanism indexes the finished part to the unload station and rotates the unhoned part into position for machining.

For more information on the honing machines, *write* Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 38, Mich.

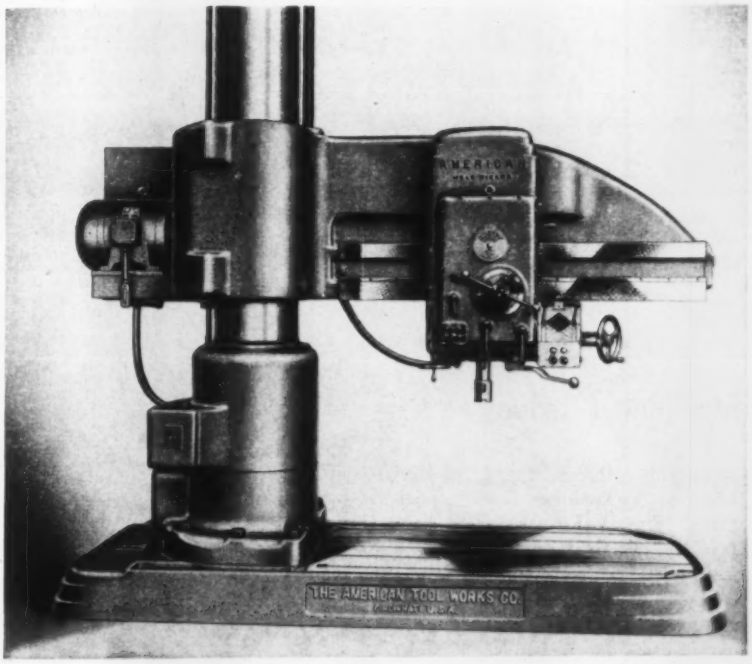
Radial Drills Can Do Precision Boring

BORING, counterboring, and spot facing done on the 19 in. column American Hole Wizard Radial is highly accurate.

Boring mill type spindles are mounted with precision Timken bearings. Convenient adjustments can be made from the outside of the head. The spindles are made of Nitralloy steel (it's nitrided for extreme surface hardness impervious to wear).

To facilitate tapping with the new drill, a 40 per cent speedup of the spindle on reverse has been added to minimize the unproductive time of backing the tap out of the tapped hole.

Power, rigidity, stability, and convenience of operation are emphasized. The machines are designed and proportioned to transmit the full overload capacity of 30 hp motors. The column and arm designs are built to use this power with a minimum of deflection. The drill is



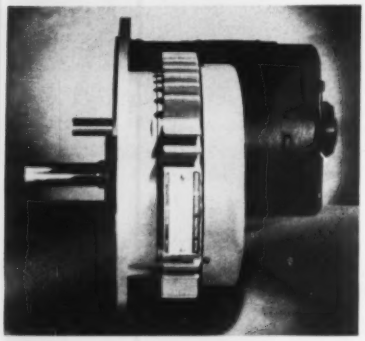
available with a 6, 7, or 8 ft arm.

For more information, *write* American Tool Works Co., Pearl Street at Eggleston Avenue, Cincinnati 2, Ohio.

Motor Is Space Saver

DESIGNED for use on machine tools, fans, and blowers, the GE Thinline motor is up to 55 per cent shorter and 26 lb lighter than standard NEMA Type D flange motors of the same rating.

The design reduces overhang, takes up less aisle space, increases elbowroom for the machine operator, and allows more compact design of equipment such as ventilating fans. The lighter motor is easier to install on original equipment and reduces unit shipping costs. Mounting can be horizontal or vertical.



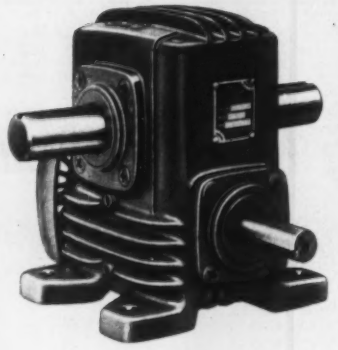
It is available in polyphase drip-proof and enclosed construction from 1 to 5 hp at 1800 rpm. The photo compares the new Thinline with a standard motor (background) of the same rating.

For more information, *write* General Electric Co., Schenectady 5, N. Y.

Fan Cooled Reducers

YOU get up to 80 per cent more capacity in Hi-Line speed reducers than in comparable nonventilated units. The Hi-Line reducers have specially designed external cooling fins and a powered cooling fan.

The units use heavy duty worms and gear reduction. They also have heavy capacity bearings, a short center distance between worm and gear, and improved heat dissipation characteristics.



The Model S (illustrated) horizontal, right angle model is available with output shaft above or below center.

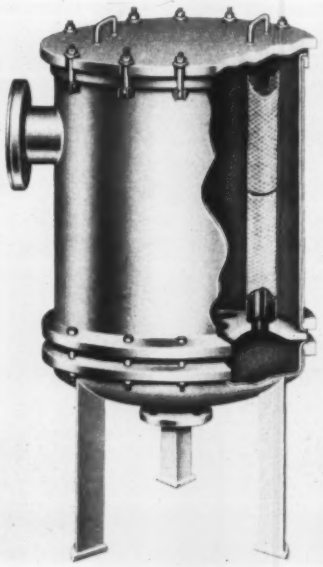
Sizes range from 1.33 to 5.25 in. center distance.

For more information, *write* Ohio Gear Co., 1333 E. 179th St., Cleveland 10, Ohio.

Filters Plating Solutions

ELEMENT replacement and cleaning is easy with the rubber-lined steel Fulflo filter for electroplating solutions. The cover is removed by loosening bolts and swinging them out of the way. The honeycomb filter tubes are then accessible for changing.

A bottom outlet allows for quick, easy cleaning of the entire vessel, simply by addition of a T-connection with a drain valve.



Choice of honeycomb filter tubes includes cotton fibers with pure nickel or stainless steel cores for acid solutions, and plain steel (or nonmetallic) cores for cyanide solutions. Honeycomb filter tubes are also produced in nylon, Orlon, Dynel, acetate, or glass fibers.

The filters are available in six sizes for capacities up to 18,000 gph.

For more information, *write* Commercial Filters Corp., 2 Main St., Melrose, Mass.

Textured Metal Solves Pattern Matching Problem

BECAUSE it is a true nondirectional, nonrepeating, nongeometric pattern, the Leeds Texture eliminates the necessity for matching secondary patterns and results in less waste and lower labor cost.

It is especially useful where textured metals are used to cover a wide expanse, as in architectural building panels. The texture offers the desired authentic stuccolike appearance.

Other advantages include greater rigidity—as much as 50 per cent increase over corresponding thicknesses of plain flat sheets. The added strength often permits gage reductions, weight saving, and lower material costs.

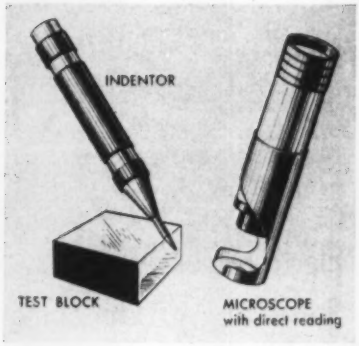
For more information, *write* Ardmore Products Inc., Aldene Road and First Avenue, Roselle, N. J.

Portable Hardness Tester Accurate to 1½ Points

QUICK, easy, hardness testing of steel alloys and other metals in the range of 25 to 65 Rockwell C can be accomplished with the Bergstrom portable steel hardness tester.

The complete test kit can be easily carried from place to place (it's pocket size). It consists of a microball indentor, a measuring microscope, a standard hardness test block, and carrying case.

The impact indentor drives a 1/16 in. tungsten carbide ball a short distance into the sample to be tested. The diameter of the in-



dentation is measured with the microscope. Since diameter is a function of the hardness, the reticule in the microscope indicates the hardness directly.

A curved surface which has a radius as small as ½ in. can be tested with the instrument.

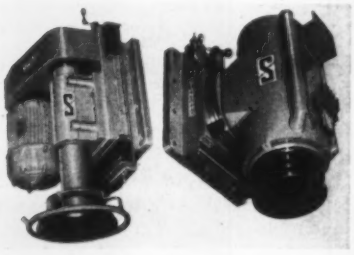
For more information, *write* Industrial Overlay Metals Inc., Eaton, Ohio.

Electrolytic Spindles Convert Standard Machine

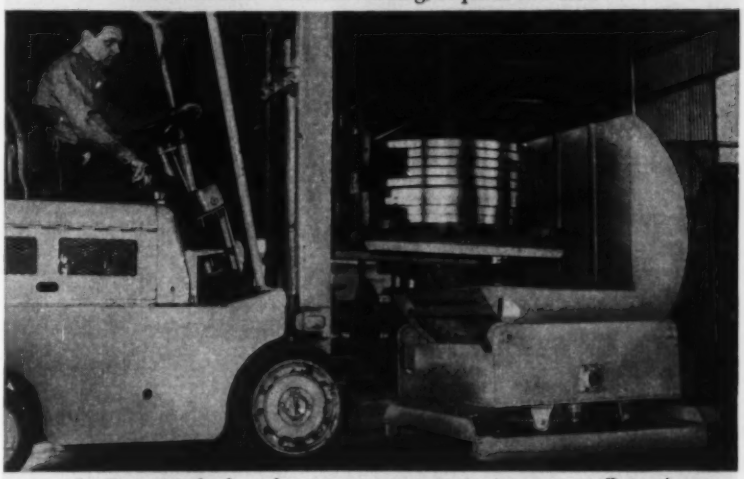
MACHINE TOOLS can be converted for electrolytic metal removal with the Standard precision electrolytic spindle. Some of the machines on which the spindles can be used are tool and cutter grinders, surface and vertical grinders, vertical and horizontal milling machines, open-side shapers, planers, boring mills, and planer type milling machines.

The spindle at left in the illustration is designed for a 600 ampere, direct current power supply. It is equipped with a 5 hp, 1800 rpm, alternating current motor. It can be used with 6, 8, 10, 12, or 14 in. straight or cup grinding wheels.

The unit at right is a direct-driven, alternating current, motorized unit with speeds of 3600, 1800, 1200, and 600 rpm. It is designed



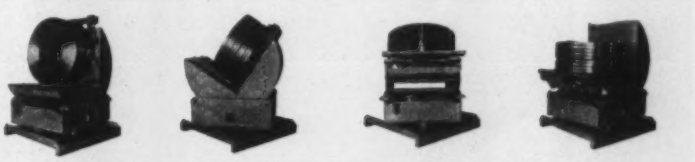
Old Method – time consuming, requires two men



La Deau Method – takes just one man, is six times more efficient!

NEW TURNOVER CRADLES PALLETIZE COILS WEIGHING TO 40,000 LBS. IN SECONDS

Producers or users of coiled materials can now palletize coils weighing from 3000 to 40,000 pounds in 14-40 seconds with the completely automatic La Deau TURNOVER CRADLE. You save up to 400% in storage efficiency, 600% in labor efficiency, and eliminate elongated coils and dangerous band breakage. If you handle *only a carload of coiled materials per month*, you can pay for a TURNOVER CRADLE in about a year, with labor savings alone. Reason: the fully portable Cradle lets one man handle as much material in one hour as two men usually handle in three hours!



FORK TRUCK SETS COILS AND PALLET ON EDGE

CRADLE TIPS BACK, BASE REVOLVES, FRONT TO BACK

CRADLE ENDS 90° ROLL OVER, BASE COMPLETES 180° TURN

PALLETIZED COILS ARE READY TO FORK

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turnover cradle

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2702 San Fernando Road, Los Angeles 65, Calif. • Telephone CApitol 2-8108

for a 3000 ampere power supply. Wheel sizes for this unit will range from 6 to 18 in. cup wheels, and 14 to 20 in. diameter straight wheels.

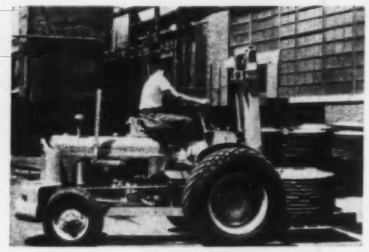
For more information, *write* Standard Electrical Tool Co., 2504 River Rd., Cincinnati 4, Ohio.

Hydraulic Side Shifter Simplifies Truck Pickup

BUILT to carry loads up to 5000 lb, the Oliver 550 heavy duty fork lift is a fast, efficient performer on many handling jobs.

An important new time saving benefit of the truck is its hydraulic side shifter. The operator can shift the carriage 3¾ in. to either side of center, simplifying pickups, saving maneuvering time, and reducing operator effort.

Easy to maneuver because of its heavy duty, 52 in. fixed tread front axle and power steering, the truck has a 12 ft turning radius, and a counterweight grille. Maximum



speed of 14.88 mph facilitates long hauls. Large drive wheels and pneumatic tires make it a stable carrier on slopes, uneven fields, unpaved roads, in mud or snow.

For more information, *write* Oliver Corp., 19300 Euclid Ave., Cleveland 17, Ohio.

Steam-Jet Cleaner Cuts Maintenance Downtime

LESS downtime and tie-up of labor and equipment are required for plant and equipment cleaning with the Pantex portable, oil-fired, steam jet cleaner.

Mounted on large, rubber tired wheels, the cleaner is a completely enclosed, compact machine with built-in soap tank and controls. It can be operated on kerosene or fuel oil. The ignition is automatic and fuel pressure is modulated to develop the gun nozzle pressure desired.

For more information, *write* Steam Generator Div., Pantex Mfg. Corp., Pawtucket, R. I.

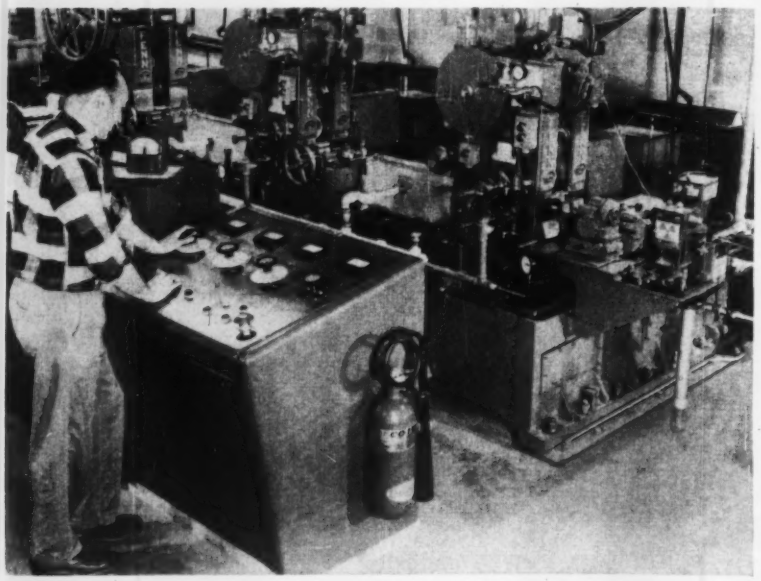
Electronic Gage Checks Precision Part Contours

DEVIATIONS as small as 10 millionths of an inch in the curvature or contour of inner and outer bearing races or other precision parts can be detected by the Accutron electronic gage.

It's designed for repetitive readings. The counterbalanced swing arm has a frictionless type Electrojet gage cartridge and pickup stylus mounted to the lower member. It sweeps the curved surface of the bearing with light but consistent pressure. The swing arm rotates through the gage arc on solid bearings that are ground and lapped to an accuracy of 5 millionths of an inch on diameter and straightness.

With standard components, the gage checks race curvature of inner and outer bearing rings from ⅜ in. to 6 in. outside diameter, ball size from 1/16 in. to ⅝ in. diameter.

For more information, *write* Sheffield Corp., subsidiary of Bendix Aviation Corp., Dayton 1, Ohio.

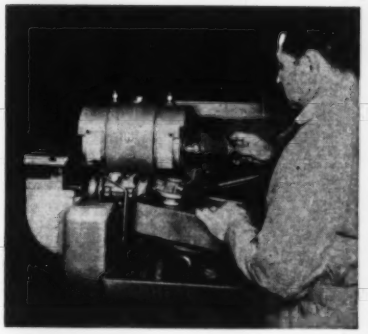


THIS THREE STAND COPPER WIRE MILL produces, from an entry round, copper tape to critical dimensions at continuous production speeds up to 1000 ft a minute. The entry wire is 0.129 in. The exit tape is 0.324 x 0.0159 in. with tolerances of ± 0.0005 in. on width, and ± 0.0005 in. thickness. The tape is automatically gaged by an Electrolimit width gage and beta ray thickness gage. For more information, **write** Fenn Mfg. Co., Fenn Road, Newington, Conn.

Tool Sharpener Handles Elliptical, Radius Tips

ONE operator can tend several of the new Heald tool sharpening machines because fully automatic reciprocation assures uniform and repetitive tool tip accuracy.

Two models of the machine are available—Model 3 for conventional



elliptical tip tool grinding, and Model 4 which can handle either elliptical or true radius tip grinding.

The Model 4 tool sharpening machine's provision for true radius grinding provides greater accuracy where the tool is used in machining contoured shapes in which contact varies about the tool tip with the configuration of the workpiece.

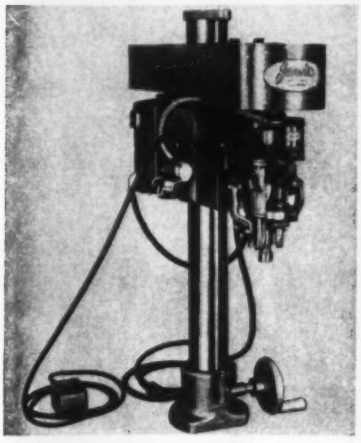
For more information, *write* Heald Machine Co., 8 New Bond St., Worcester 6, Mass.

Adjustable Pitch Tappers Are Fully Automatic

AN AUTOMATIC, adjustable pitch lead screw tapper, adaptable to any drill press table, provides rapid conversion from one pitch to another. Tap depth is electrically controlled and can be set to any depth within the stroke of the lead screw unit.

The tapping cycle can be interconnected with the controls of an indexing table.

The tappers can be equipped with standard, hand operated, lead screw units where complete automa-



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tion is not desired. They can also be supplied with multiple spindles.

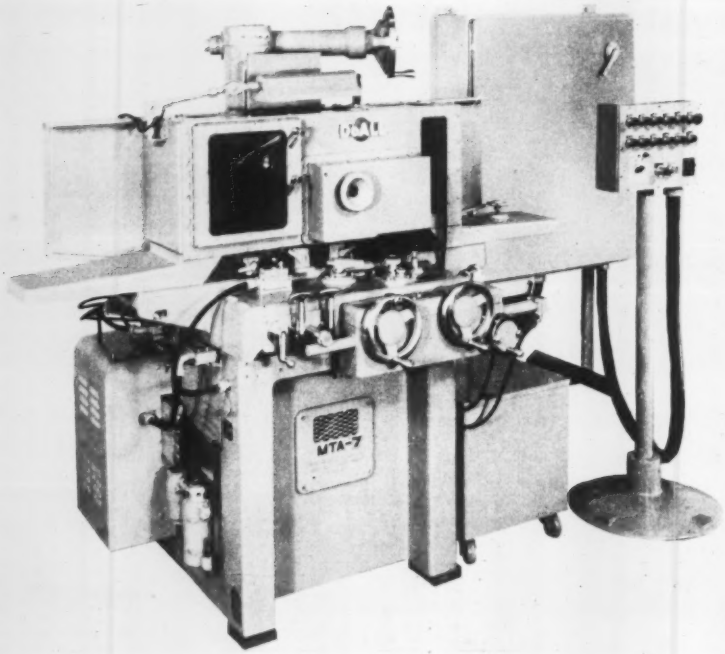
For more information, *write* Jarvis Corp., Middletown, Conn.

Heavy Duty Sweeper Is Battery Powered

LARGE areas can be cleaned quickly with the Model 80-E sweeper. Traveling at speeds up to 4.5 mph, the machine has a maximum cleaning path of 53 in., including side brush (for flush-with-wall sweeping).

Equipped with a 24 volt, 365 ampere hour battery, the unit sweeps 8 hours on a single charge. An important feature is the use of two 1 hp motors (one for propelling, one for sweeping) in combination with an interbalanced brush and vacuum system. Since brush speed and vacuum suction are constant, the machine can travel slowly in congested areas with no loss in sweeping efficiency or dust control.

For further information, *write* G. H. Tennant Co., 721 N. Lilac Dr., Minneapolis 22, Minn.



Machine Slices Hard, Brittle Materials

HARD or brittle materials can be accurately sliced at high production rates with the Model MTA-7 Microtom-atic slicing machine.

The thickness of the slices is limited only by the cutter width and by the material characteristics. Indexing is done by a new crossfeed mechanism with high repetitive accuracy. Variable spindle speeds permit exact balance of optimum cutting factors for best performance.

Because of the delicate nature of many hard, brittle materials, a high speed spindle with great accuracy is used on the machine. A flat belt connects the spindle to a 1½ hp dynamic eddy current drive which provides speeds from 5000 to 10,000 rpm. The completely enclosed work area permits a plentiful supply of coolant for efficient cutting. A built-in, waterproof, fluorescent light illuminates the operation so that it may be watched through the wiper-equipped window. The spindle is introduced into this area by means of telescoping metal seal.

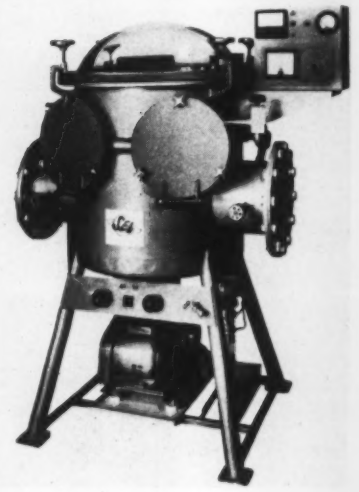
For more information, *write* Do-All Co., Des Plaines, Ill.

Atmosphere Chambers Have Full Visibility

THESE controlled atmosphere chambers are as convenient to use as working in the open, says the manufacturer. Their usefulness is increased by a variety of fixtures such as welding systems, furnaces and ovens, and feedthroughs.

Atmospheres with contamination of less than 1 part per million can be obtained without excess and wasteful inert gas flushing. Standard models have vacuum systems capable of reducing chamber pressures to less than 1×10^{-4} mm of mercury before introduction of the uncontaminated atmosphere. Other models are available for higher purity requirements.

The chambers are made of stainless steel. A full-view, extra strength

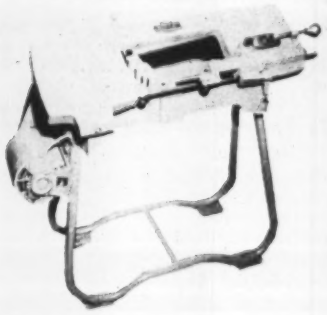


Plexiglass dome provides maximum visibility. Ultimate vacuums of 5×10^{-4} mm of mercury can be reached in less than 20 minutes.

For more information, *write* Scientific Engineering Laboratories, 1510 Sixth St., Berkeley 10, Calif.

Cutoff Bandsaw Has Hydraulic Feed Control

HERE is a fast cutting, continuous, metal cutoff machine with adjustable hydraulic feed control for infinitely variable blade feeds. It weighs only 95 lb, so it can be easily moved to the job.



A quick-action vise makes it easy to change to different work sizes. The vise adjusts up to 45 degrees. Rollers are adjustable to the stock size giving maximum support to the blade.

For more information, *write* Covel Mfg. Co., Benton Harbor, Mich.

Truck Fork Design Adds Handling Versatility

THE FORKS and carriage of the Extend-a-Load electric lift truck are moved forward and backward hydraulically in a pantograph fashion when picking up and depositing a load.

This feature saves valuable floor space. There's no need to straddle the bottom load with outrigger wheels. Closer placement of stacks is possible.

The Extend-a-Load truck is part of the Yale Warehouser line. It is available in 2000, 3000, and 4000 lb capacities.

For more information, *write* Materials Handling Div., Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa.

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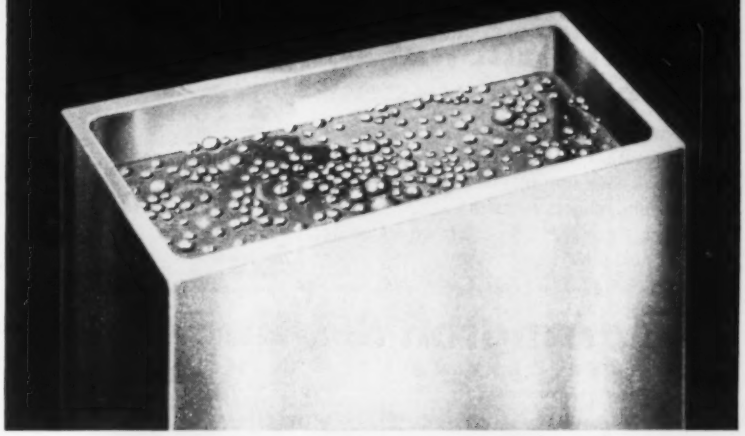
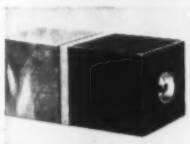


MAJOR BREAKTHROUGH IN ULTRASONIC TECHNOLOGY!



In determining which ultrasonic cleaner to buy, remember that all ultrasonic cleaners are not alike. There is variation in uniformity of cavitation. There is variation in the transducer — and the transducer is the heart of an ultrasonic cleaner. The Multipower transducer developed by Acoustica research, multiplies the power and efficiency of ultrasonic action. Cleaning is faster, labor costs are lower.

Acoustica ultrasonic cleaners are engineered and produced to the finest standards, unequaled in quality and value. Off-the-shelf in capacities from 1 to 75 gal. or custom built to 5000 gal. Expert Acoustica engineers can help you with your cleaning problems.
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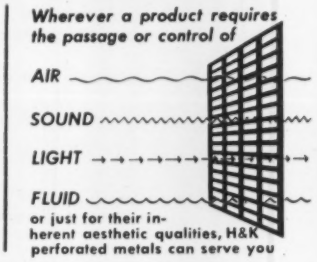

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NEW literature

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Spray Coatings Booklet

"Vacuum Metallizing Spray Coatings," 18 pages, discusses thermosetting coatings for use with metallizing thermoplastics, thermosetting plastics, metals, and glass. Logo Div., Bee Chemical Co., 12933 S. Stony Island Ave., Chicago 33, Ill.

Industrial Marker Chart

A chart shows the proper marker to use (crayon, chalk, or industrial pencil) on almost every type of industrial material. Dept. CSC, Joseph Dixon Crucible Co., Jersey City 3, N. J.

Applications for Silicones

An 8 page catalog (CDS-129A) highlights GE's major silicone products and their uses. Silicone Products Dept., General Electric Co., Waterford, N. Y.

Techniques for Magnesium Alloys

"Shop Guide for Elevated-Temperature Magnesium Alloys," a 28 page booklet, describes recommended practices for working magnesium alloys of the thorium and rare earth metal families. Magnesium Products Sales Dept., Dow Chemical Co., Midland, Mich.

Industrial Chemical

A 40 page booklet presents the physical and chemical properties of butynediol and discusses its applications as a corrosion inhibitor, plating brightener, and solvent. Antara Chemicals, General Aniline & Film Corp., 435 Hudson St., New York 14, N. Y.

Stainless Alloys Data

"PH55 Alloys," 10 pages, gives mechanical, corrosion resisting, and high temperature properties of molybdenum containing 18-8 type stainless alloys. Sales Promotion Dept., Cooper Alloy Corp., Hillside, N. J.

Aircraft Tubing Handbook

Technical Handbook A-2, describes seamless aircraft tubing, carbon and alloy steels. Tube Div., Copperweld Steel Co., Shelby, Ohio.

Material Handling Information

"Walkie or Rider Trucks," 8 pages, outlines advantages and applications for both types of trucks, and lists facts to consider when analyzing truck requirements. Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.

Noise Control Data

An 8-page booklet, K4E, gives engineering specifications and performance data for 27 types of products for the control and measurement of machinery vibration, shock, and noise. Korfund Co. Inc., 48-40E 32nd Place, Long Island City 1, N. Y.

Spray Equipment Selector

An 8 page spray equipment selector describes the three steps necessary before making a selection of equipment for a specific job. Binks Mfg. Co., 3122 Carroll Ave., Chicago, Ill.

Photomicrography Data

A 6 page pamphlet provides specific data on exposure and processing of Kodak Metallographic and Kodak "M" plates along with sensitometric data. Special Sensitized Product Sales Div., Eastman Kodak Co., Rochester 4, N. Y.

Tape Controlled Positioning

A 10 page brochure (Form LO-5902) describes the advantages of tape control and illustrates various applications. Advertising Dept., Jones & Lamson Machine Co., Springfield, Vt.

NEW BOOKS

Metal Cutting Tool Handbook, Metal Cutting Tool Institute, 405 Lexington Ave., New York 17, N. Y. 750 pages, $7.50

This revised edition presents the latest data on twist drills, reamers, counterbores, taps, dies, milling cutters, hobs, gear shaper cutters, gear shaving cutters, and broaches. In each section, information is presented on the design, proper application, and the maintenance procedures of the tools described. This is followed by tables of dimensions and tolerances of standard sizes of tools. Engineering tables and other data commonly used in the metal cutting industries are bound in a separate section at the end of the book.

The Grinding Wheel, Grinding Wheel Institute, 2130 Keith Bldg., Cleveland 15, Ohio. 532 pages, $4.95

The revised and updated edition discusses grinding wheels, machines, and operations from a basic, as well as a practical standpoint. Several chapters are devoted to efficient wheel selection, abrasive materials, and fundamentals. A troubleshooting chart suggests corrective measures for many problems. New subjects introduced in this edition include jig, electro-assist, and optical projection grinding, filtering of grinding fluids, and grinding of ceramics.

Coated Abrasive—Modern Tool of Industry, Coated Abrasive Manufacturers Institute, McGraw-Hill Book Co. Inc., 330 W. 42nd St., New York, N. Y. 426 pages, $8.50

This is a comprehensive guide to the use of coated abrasives in industry, covering their nature, advantages, and applications. It shows how abrasives are manufactured and describes factors for effective use. Many recent advances are covered, including new automatic machinery. Applications include strip scouring preplate finishing, and contour finishing. It may help you to decide what operations in your plant may be done better with coated abrasives. Methods showing how to achieve the most efficient and economical results are incorporated.

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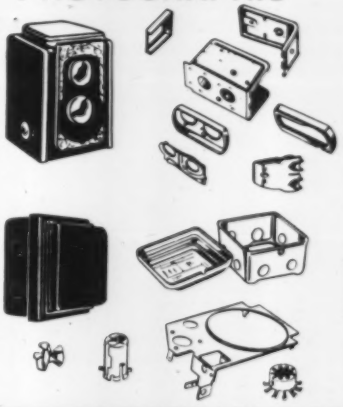

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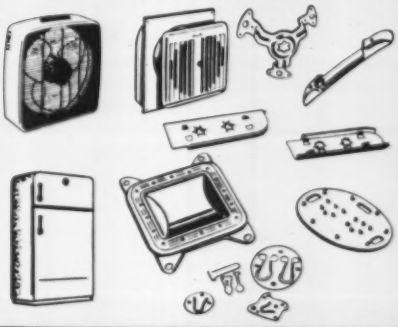

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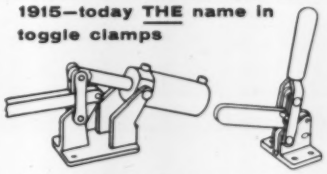

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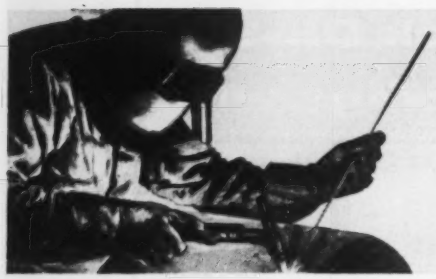

WELDING CLINIC

J. Imperati and R. F. Pulver, Welding Engineers
The American Brass Company, Waterbury, Conn.

Steel products are assembled economically with Anaconda filler metals—by brazing or braze welding

Many of the steel products encountered in our everyday lives are assembled by economical braze welding and brazing with dependable and versatile Anaconda filler metals. Among these products are home, school and office furniture, frames for wheeled toys, bicycles and portable power generators, screen and storm-sash frames, sink and refrigerator cabinets, etc.

BRAZE WELDING. The filler metals used are Anaconda-997 (Low Fuming) Bronze, Tobin Bronze®-481, and Nickel Silver-828. Their low application temperatures produce distinct advantages for oxyacetylene braze welding, such as excellent control, simple joint and fixture designs needed for efficient production, and low distortion. In addition, when molten, they easily bridge gaps in poorly fitted joints and readily build up fillets and reinforcements to develop maximum joint strengths.

TWO HALVES of stainless-steel knife handles are joined by controlled-atmosphere brazing using Anaconda Nickel Silver-828 Welding Wire at The Imperial Knife Company.

BRAZING. Most of these advantages are also available when the alloys are used for brazing in induction-heating and controlled-atmosphere furnace operations. An excellent example is the manufacture of stainless-steel handles for table knives. Imperial Knife Co. of Providence, R. I., uses Nickel Silver-828 for controlled-atmosphere brazing in production of the knife handles shown at the right, above. High-quality joints are essential for durability and good appearance, and high quality is just what this alloy confers. It develops high strength by making full-section joints, and the polished joints are inconspicuous because the alloy's color is so close to that of the steel.

The $\frac{1}{16}$" diameter wire is cut into short lengths which are placed within the hollow handles when their two halves are assembled before entering the furnace. When the brazing temperature is reached, the molten filler metal flows by capillary action between the butted edges to bond the joint completely.

FOR MORE INFORMATION. Anaconda distributors will gladly help in the selection of the exact rod for your job. Or write for a copy of Publication B-13. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 5978

SIDE OF A HOSPITAL BED being assembled at Simmons Co., Kenosha, Wisc., by braze welding with Anaconda-997 (Low Fuming) Bronze Welding Rod.

ANACONDA®
WELDING RODS
Made by
The American Brass Company

June 8, 1959

Demand Strengthens Third Quarter Prospects

STRONG DEMAND for sheets and plates is brightening the outlook for the third quarter. Steelmakers are taking surprisingly big orders for July, August, and September.

Assuming that there'll be no strike and that most of the tonnage will stick, sheet mills may operate close to capacity during the summer. Even though the automotive and appliance industries will be well stocked, thousands of smaller consumers will need all the steel they can get. Business has improved so rapidly that users haven't been able to boost their inventories to levels that will sustain their production schedules. Demand for coated sheets is so strong that third quarter production is almost sure to be at capacity.

NO DROPOFF IN JULY—Since steelmakers are two to five weeks behind schedule on sheets, carryovers alone will make July a busy month. Some of the orders being placed for August and September will undoubtedly be moved back if a strike is avoided, but the percentage will be small. Reason: The consumption rate will be only slightly lower than it is now (7 million tons a month). Leading plate producers expect to operate at 75 per cent of capacity during the third quarter.

PLATE PRODUCERS GAINING— Steelmakers who are in arrears now may not be able to catch up by the end of the month, but some companies are narrowing the gap. A plate producer who had been a month late on shipments from his 96 in. mill is now three weeks behind schedule. Deliveries from a 160 in. mill are five to six weeks late, but it's hoped that the July carryover won't be more than a month.

AUTO SALES BOOMING— In the second ten days of May, retail deliveries of American made cars averaged 20,700 daily (vs. 19,700 in the first ten days of the month). Assemblies in the first five months of the year total 2.7 million, or 43 per cent more than the 1.9 million produced in the corresponding period of 1958. Automakers hope to have 90 day steel inventories by June 30, but only General Motors Corp. and Chrysler Corp. are likely to reach their goals.

STRIKE'S IMPACT WEIGHED—If there's no strike, steelmaking operations will average 63 per cent of capacity in the third quarter and production will be about 23 million ingot tons. Fourth quarter operations should average 75 per cent, with production of 28 million tons. A two week strike will result in the loss of 4 million ingot tons; a four week strike, 7.4 million; a six week strike, 10.3 million; and an eight week strike, 14.3 million.

If a shutdown costs the industry more than 10 million tons (or lasts longer than six weeks), steelmakers won't be able to make up the lost tonnage by the end of the year. An eight week strike will cut the year's output from 115 million ingot tons to 110 million. Even if steelmakers boost September operations to 85 per cent of capacity (the best that could be hoped for in the first month after a strike) and run at 95 per cent instead of 75 in the fourth quarter, they'll still lose 5 million tons.

PRODUCTION AT PEAK—Last week, steelmakers operated their furnaces at 94 per cent of capacity and turned out 2,661,000 ingot tons, the largest production ever recorded.

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*Current prices were published in the June 1 issue and will appear in subsequent issues.

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Freeport Sulphur Co.

Islands of Steel: Rebirth Of a Market for Metalmen

OFFSHORE mineral exploration and development show signs of emerging from the doldrums of the last couple of years. Recent Louisiana underwater leases brought record bids (up to $3000 an acre). A government offering of 450,000 acres off the Florida Keys was the first federal auction on the outer continental shelf since July, 1955.

Drillers with idle platforms and rigs (often called steel islands) are encouraged by the trend. They're anticipating steadier employment for *Mr. Gus* and *Mr. Louie*, quaintly named craft that typify offshore drilling facilities everywhere.

At one time last year, two-thirds of available equipment was tied up at wharves. There's more activity today, but it's still far under the peak of several years ago, when there wasn't enough equipment to go around.

• There were 110 active operations off the Louisiana coast alone at the peak, the Gulf of Mexico being liberally freckled with rigs and platforms of all kinds.

Some authorities think there'll be a pickup when the tidelands dispute over traditional state boundaries is settled. The case comes before the U. S. Supreme Court in October.

About 62 million barrels of offshore crude oil are expected this year vs. 54.6 million in 1958. Possibly 200 billion cu ft of gas will be produced. That's said to be double the 1956 output, emphasizing the predominant interest in gas.

Experts say the severe problems of offshore work—deep water, difficult transportation, high operational and equipment costs—will be largely lacking in the new Louisiana ventures. The tracts are in shallow water, within three miles of shore, and in proved or semi-proved areas.

Most offshore drilling is within 30 miles of shore. The record is 60 miles, and deepest water 140 ft. Near-shore tracts are choice spots, so the Louisiana leases could mean a sharp pickup in activity this year, especially since leaseholds are less costly if development starts within a year of their acquisition.

• Right now in the outer continental zones, only minimum drilling to meet lease requirements and keep equipment operating can be expected.

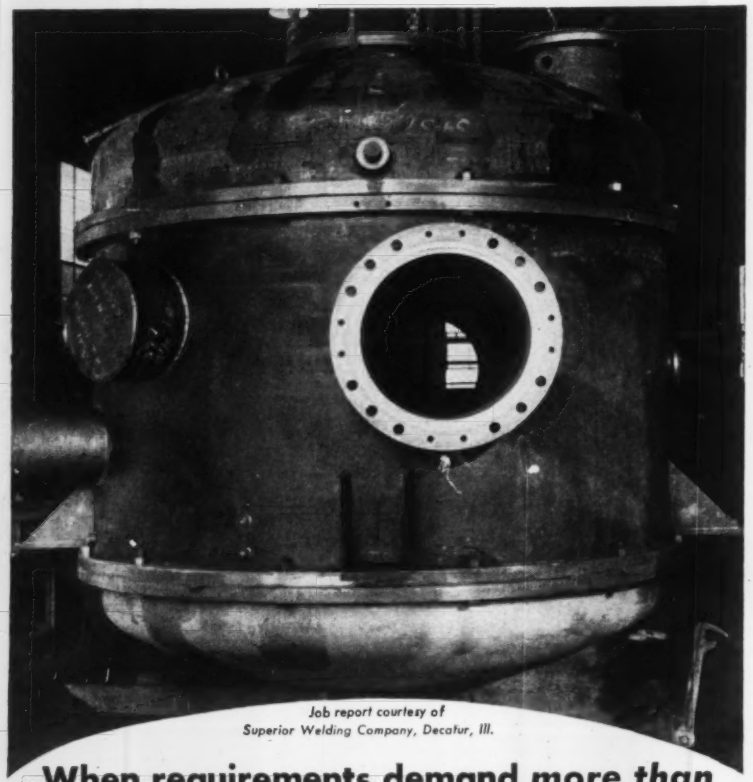
It's a situation that's not without its compensating factor—it gives operators time to cut their astronomical costs by developing improved techniques in underwater drilling, production, and transportation.

The cost of steel islands, drilling ships, barges, mobile platforms, and rigs, is staggering. It's estimated over $2 billion have been spent on offshore work over the last 20 years.

• Freeport Sulphur Co. is building the world's largest permanent steel island off the Louisiana coast.

It will cost $30 million, including a 7-mile pipeline to deliver molten sulfur to the mainland (see picture). When completed next year, *Grand Isle* will be home away from home for 250 workmen, who will be transported to and from work (five days on, five days off) by helicopter. A Y-shaped structure nearly a mile long and rising 60 ft above the water, the island will consist of 15 steel towers connected by 200 ft spans.

Five large towers will support a



Job report courtesy of
Superior Welding Company, Decatur, Ill.

When requirements demand *more than* the "*ordinary*" in Stainless Welds

WELD WITH ARCOS

STAINLESS ELECTRODES

This vessel shell will become part of a high vacuum melting furnace. It is constructed of 304 ELC stainless steel except for supporting lugs and minor fittings of carbon steel. The stainless section was welded with Arcos CHROMEND K-LC Electrodes to assure sound, leak-free welds under high vacuum operating conditions. The chemical analysis of Arcos CHROMEND HCN proved highly successful for joining the dissimilar base metals—carbon and stainless steels. On *any* job, Arcos quality will pay you the dividends that come from a job well and reliably done. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

sea water heating plant, three drilling platforms, shops, and living quarters for the crew. At the end of the Y arms, there will be two drilling units, and facilities for collecting and measuring the sulfur as it comes from the deposit 2000 ft below. A third platform will be some distance away.

• Freeport's island is unique in sulfur mining, but underwater gas and oil drilling has been done from self-contained platforms for years.

Back in 1938 (when offshore work really got started), open water drilling was from platforms resting on steel caissons driven through the ocean floor. Costing over $1 million each, they were only 45 per cent salvable.

Today, self-contained units are preferred to tender-platform combinations for some jobs, notably in deep water. An unusual caisson-type platform is working in 100 ft of water 2.2 miles off the California coast. It can withstand severe storms and earthquakes, being anchored in 6000 tons of sand and concrete.

The general trend in facilities in recent years has been toward mobile platforms and rigs. Towed to drilling position, their legs are dropped to the ocean floor. Piles are driven in place, and platforms raised to service height above the waves. Pipelines carry the oil or gas to the mainland. When locations are proved, the platforms are moved practically intact.

• Steelmen, petroleum engineers, and shipbuilders combined their talents to develop a platform with a submersible hull that's wholly salvable.

Some of these sea monsters are as tall as a 25 story building, and can drive holes three miles deep in the ocean floor. They are equipped with complete drilling facilities, some of them with a heliport to facilitate transport of supplies and crew. Such vessels are built of steel with high ductility, low notch sensitivity, and low transition temperature, made to American Bureau of Shipping specifications. It's said they can be kept in service for five years without drydocking for major overhauls.

One type platform is of twin deck design, each deck riding on

280 ft caissons in the ocean floor.

A recently commissioned structure with a barge type hull can drill three 20,000 ft wells from one location.

Another newly built mobile unit, *Mr. Louie* (after Louis J. Roussel, president, Universal Drilling Co.), has several newly developed features. The 4000 ton barge is 133 ft wide, and can operate in water up to 120 ft deep, with 40 ft clearance above the waves.

• Most offshore equipment is made of steel, but that metal hasn't a monopoly.

Structures largely of aluminum are used in Lake Maracaibo, Venezuela, chiefly because of that metal's resistance to Maracaibo's exceptionally corrosive water. Concrete, not steel, is aluminum's chief competitor there. But aluminum structures go in faster than concrete, minimizing the cost differential.

Experts forecast a 63 per cent increase in U. S. oil needs, and a 111 per cent rise in foreign consumption over the next decade. That should mean more offshore exploration on the continental shelf, which provides one of the nation's greatest reserves of oil and gas.

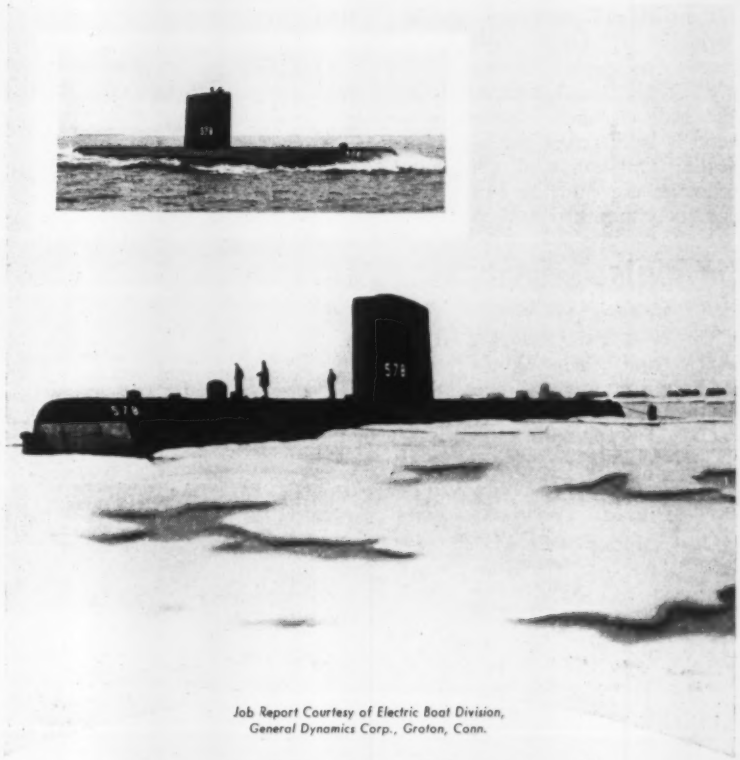
Shipbuilders and equipment suppliers may not immediately benefit from an upturn in activity, but their long-term prospects are promising. The search for "liquid gold" will gain vigor as current oil surpluses are liquidated, and economic pressures force the bringing in of new reserves. Steel islands will make possible the opening up of vast untapped underwater mineral resources all over the world.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 147 & 148

Much depends upon operating conditions the remainder of this month, but allowing for a modest lag, it appears that sheetmakers will have a carryover of two to three weeks' production. The carryovers on cold rolled and galvanized will probably be the most extended. Among the specialties, the mills are likely to be most behind on enameling stock.

While much of the steel the mills will ship consumers before June 30 is for protection against a mid-



Job Report Courtesy of Electric Boat Division, General Dynamics Corp., Groton, Conn.

For maximum weld strength at sub-zero temperatures

WELD WITH ARCOS

LOW ALLOY ELECTRODES

The Skate (above), as well as the Nautilus, Seawolf, Swordfish, Skipjack and Triton are among the "greats" in America's atomic powered sub force carrying welds produced by ARCOS low alloy electrodes. ARCOS Tensilend 80, 100, 120 and Ductilend were used to assure welds of highest possible impact strength whether on missions in the tropics or the sub-zero arctic. When you need weld metals with similar qualities, ARCOS is well worth remembering. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

year strike, mill executives are increasingly optimistic about third quarter prospects. Bookings for July, August, and September are described as "quite strong." Demand is brisk across the board, indicating that almost all consuming industries are enjoying better business than they had anticipated.

Tin Plate . . .

Tin Plate Prices, Page 148

Tin mills are producing at capacity, and their third quarter bookings are reported average for the season. Volume probably will not equal that in the second quarter, though some buyers have not been able to build inventories to the levels planned.

Can shipments in March were 340,861 tons vs. 303,782 tons in February and 353,610 in March, 1958, reports the Bureau of the Census. First quarter shipments of 958,484 tons lagged behind the 984,099 tons shipped in the like 1958 period.

Steel Bars . . .

Bar Prices, Page 146

Some commercial bar sellers are about current with commitments. Others are running behind a week to ten days, and a further lag is expected by the end of this month because it's believed the present level of operations will not be maintained. Producers of cold-finished bars are complaining that the hot bar mills are two to three weeks behind schedule on shipments.

Most consumers feel they'll have sufficient inventories at the end of June to carry them possibly four to six weeks in the event of a steel strike.

Buying for the third quarter is fair, but spotty. Some mills are still accepting July delivery orders. Expectations are that some consumers' requirements in the last half will be heavier than they were in the first half, notably alloys and specialties needed for defensework.

On the basis of current cold-finished bar shipments, automotive suppliers are the cold drawers' best customers. From an order entry standpoint, steel service centers head the list. Much of the tonnage being ordered by the distributors is for immediate shipment.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 147

Heavy requirements for reinforcing steel of all types is keeping the mills busy trying to meet shipping promises. In New England, for example, first half bar and mesh tonnage has been nearly as heavy as that for fabricated structural steel. The situation is said to be unusual in the heavy building industry.

As in the case of fabricated structural steel, weak prices for reinforcing bars are resulting in uneven distribution of orders, notably for bridges. Some distributors in New England are not quoting at all on bridge requirements.

Strike Could Push Up Imported Steel Prices

Competition from foreign steel continues severe along the seaboard and is spreading to the Great Lakes area.

Hot rolled and cold drawn carbon bars are being offered at Atlantic Coast ports by British producers for delivery at about $30 a ton under the domestic market. Shipments are promised in three to four weeks. Offerings include a wide variety of sizes in rounds, squares, hexagons, and flats.

A survey of brokers' yards and foreign mill depots in the Houston area shows that at least 50,000 tons of imported steel have been accumulated in anticipation of a strike.

Prices of imported steel are being shoved up in the area. They have gone up more than $12 a ton since February. One Houston source reports that foreign mill representatives recently met in New Orleans to set sharply higher U. S. price schedules in event of a strike.

Some wide flange structurals are being imported from Great Britain at Vancouver, B. C. They are quoted under American price levels.

In the Los Angeles area, heavy imports of Japanese reinforcing bars are reported.

Stainless Steel . . .

Stainless Steel Prices, Page 150

Armco Steel Corp., Middletown, Ohio, plans a $17 million stainless steel facilities expansion at its Butler, Pa., Works. Contracts have been awarded for construction of more than 125,000 sq ft of plant space, and installation of a 50 in. Sendzimir cold reduction mill, rewind line, coil line, annealing and pickling line, and material handling facilities.

To be completed by late 1960, the expansion will enable Armco to produce wider stainless steel sheets and coils at closer tolerances.

British Steel Prices Cut

British steel prices were cut $2.80 a ton (about 2 per cent) June 1 on shipments of 10 tons or more. The reductions are regarded by the British Iron & Steel Board as essentially a long term measure—not merely a move to push production up quickly from the current 81 per cent of capacity level.

Many customers have been buying small lots. It's hoped the reduced prices on 10 ton and larger lots will induce them to place more substantial orders. Resulting production and transportation efficiencies, it's estimated, may effect an annual saving of some $33 million for the industry.

Plates . . .

Plate Prices, Page 146

Plate mills are operating at full speed, and most of them will have little more than two weeks carryover at the end of this month. Third quarter specifications are being fairly sustained, but some producers say they can still work in a little tonnage for July. Orders are also being placed for August and September on a moderate scale.

Fabricated pipe, bridge construction, tank and boiler work, and shipbuilding, are taking considerable tonnage but in tapering volume. Requirements for heavy industrial equipment continue disappointing. Railroad demand is spotty.

Third quarter orders are fair. Alloy plates have been moving well until recently, but, along with certain plate specialties, they are now less active. Naval shipyards are not ordering as actively for the third quarter as they did for the second.

At Pittsburgh, demand has slackened, apparently because customers have no chance of getting extra tonnage the remainder of this quarter. Producers aren't sold out for July, but bookings will be substan-

tial—perhaps equivalent to 75 per cent of capacity.

Carbuilders are pressing for delivery of everything they've ordered before July 1. Of all major plate consumers, they seem to be in the poorest inventory position.

Wire . . .

Wire Prices, Pages 148 & 149

Most wire tonnage bought for delivery before June 30 will be delivered, although a little lag in shipments of manufacturers wire items is noted. No difficulty is being encountered in the merchant trade products. The situation could change quickly, especially if there are wildcat strikes or slowdowns before the end of the month.

Rod inventories average 60 days in New England. In that district, users of finished wire are maintaining consumption at a high rate and in some cases have not built up inventories to the levels planned. This includes fastener and spring producers.

Stiff competition from imported products continues.

Tubular Goods . . .

Tubular Goods Prices, Page 150

On-the-spot sales to some of the 32,000 oilmen attending the International Petroleum Exposition in Tulsa, Okla., have convinced pipemakers that the petroleum industry will be a good customer the rest of this year.

Drilling contractors and major oil producers have made substantial additions to their tubing and casing inventories. They'll not be greatly affected by a steel strike unless it lasts longer than 60 days.

Sold out for the first half on almost all oil country products, steelmakers note a strong demand for specialties and the smaller tubes. Large diameter carbon items are moving sluggishly.

Orders for third quarter are a far cry from those that came in during the first six months. Sales are slow and spotty. About the only products that are being booked in quantity are specialty items, such as alloys for deep, high pressure wells.

Despite slow buying by some segments of the oil industry, particularly the refining branch, steelmakers are encouraged by the upturn in drilling. The number of rotary rigs operating in the U. S. climbed to a 1959 high during the week ended May 25, Hughes Tool Co.'s survey showing 2197 at work—up 81 from the previous week, and 399 over a year ago.

Due to the availability of prompt shipments, New England distributors did not accelerate their orders for buttweld pipe until this month. Pressure for direct shipments of seamless pipe has intensified, and it now appears certain all the seamless wanted this quarter will not be delivered on time.

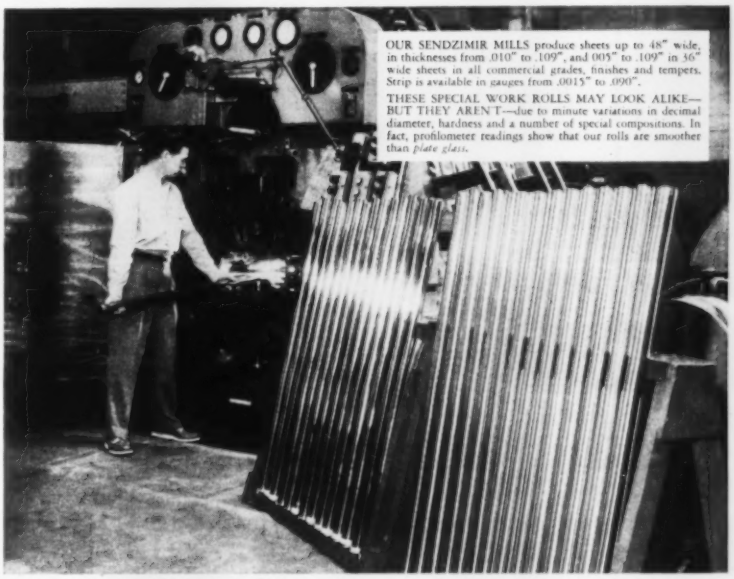
Distributors . . .

Prices, Page 151

The volume of business placed with steel service centers is picking up, but there is no surge of buyers seeking mill size tonnages. May was the best month this year; June should be better.

With the steel strike deadline approaching, some "scare" buying has developed. And metalworking firms are laying in tonnages for maintenance and repairs during vacation periods.

Business picked up about a


OUR SENDZIMIR MILLS produce sheets up to 48" wide, in thicknesses from .010" to .109", and .005" to .109" in 36" wide sheets in all commercial grades, finishes and tempers. Strip is available in gauges from .0015" to .090".
THESE SPECIAL WORK ROLLS MAY LOOK ALIKE—BUT THEY AREN'T—due to minute variations in decimal diameter, hardness and a number of special compositions. In fact, profilometer readings show that our rolls are smoother than *plate glass.*

It takes more than just a precision mill to produce* STAINLESS STEEL *of MicroRold® quality

. . . it takes Operating Know-How. Only Washington Steel, first to use Sendzimir sheet rolling, can offer you 10 years of practical experience with these mills.

Every hot-rolled stainless steel band has variations in thickness and surface characteristics which must be compensated for in the cold-reduction process to obtain precise gauge and flawless surfaces. To do this, special work rolls with minute diameter differences along the length of the roll are used in controlling such variations as crown, edge and camber. To accurately control all the possible variations requires a large number of these rolls, plus *highly skilled operators* who know from experience which rolls, speeds and reductions are required. These are but a few of important factors in quality rolling which can only be learned by *long* experience and association with precision mills.

Washington Steel is the only producer whose entire production stainless steel sheet and strip is rolled exclusively on the Sendzimir Mill.

WASHINGTON STEEL CORPORATION
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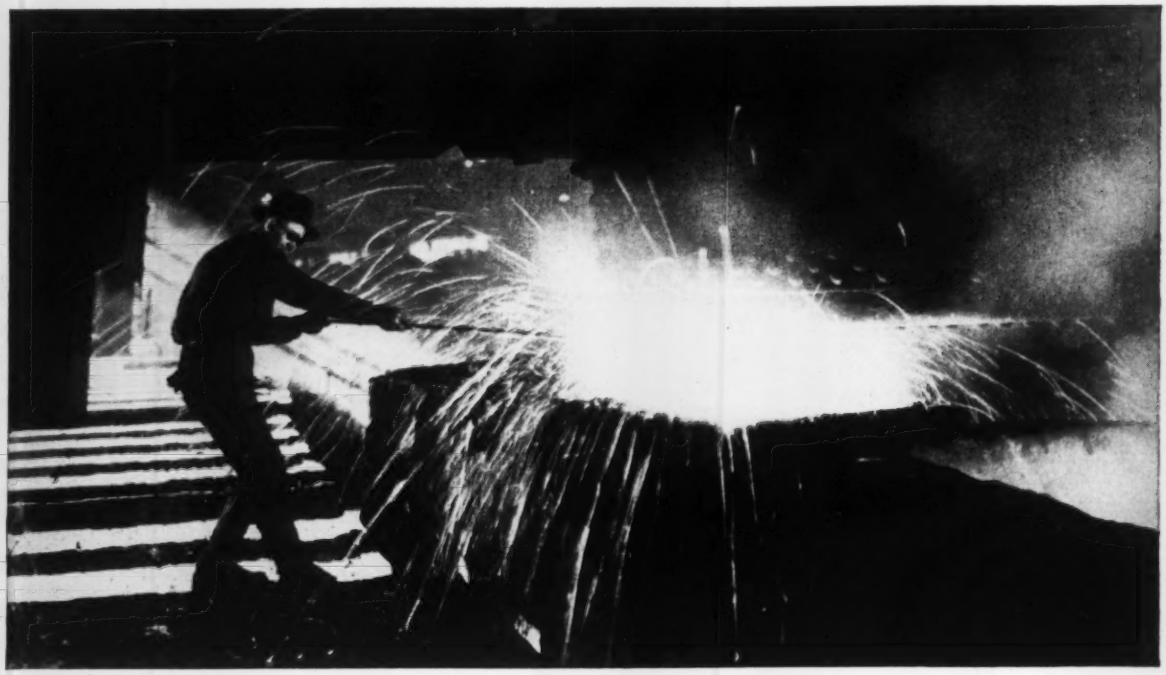

—who buy Savings Bonds and strengthen America's Peace Power

Men and women who earn their living in the steel industry can take great pride in knowing that their crafts and skills contribute, through raw material supplies, to nearly every other great industry in the United States. They can also be proud of the help thousands upon thousands of them are giving to America's Peace Power through the purchase of U.S. Savings Bonds.

Through regular purchase of Shares in America, these thrift-conscious people are reinforcing their own security after retirement, and establishing current reserves for such worthwhile family projects as new homes, education and travel.

If your company has not put in a Payroll Savings Plan thus far, you can start immediately. Just telephone your State Savings Bonds Director and accept the help he wants to give you. Or write to Savings Bonds Division, U.S. Treasury Department, Washington, D.C.

J. K. Thomson is shown here at his work in one of the great steel mills of this country. Like thousands of his fellow craftsmen, Mr. Thomson is making regular use of his company Payroll Savings Plan to contribute to the Peace Power of his country.

STEEL
The Metalworking Weekly

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

month ago when consumers found their working requirements increasing faster than they had anticipated. They also became more concerned about the possibility of a strike in the steel industry.

Inventories held by steel service centers are generally excellent. Distributors continue to round out their stocks in anticipation of heavy demand if there is a prolonged strike. In Los Angeles, flat-rolled steel and structural shapes shipped from eastern mills are in short supply.

Rails, Cars . . .

Track Material Prices, Page 149

Freight carbuilders will probably be among those consumers pinched for steel supplies if a strike cuts off production at the end of this month. The railroads didn't start ordering cars in volume until the business upturn was well advanced, and it was too late then for carbuilders to cover their needs to any great extent.

Result: The car manufacturing plants have been forced to put a heavy proportion of their steel receipts from the mills into production, leaving them little for inventory.

Plate and structural fabricators are in somewhat similar position. They can't purchase steel in sizable quantities until job contracts are received, and they know what sizes of steel will be required.

Few steelmakers see any chance to improve their delivery position prior to June 30. If anything, shipment delays are likely to lengthen, especially if there are wildcat strikes and production slowdowns.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 152

Youngstown Sheet & Tube Co., Youngstown, will rebuild the 84-oven coke battery at its Brier Hill Works, W. H. Yeckley, vice president-operations, announced last week. Contract was awarded Wilputte Coke Oven Div., Allied Chemical Corp.

The new ovens will be equipped with self-sealing doors, improving control of gases and smoke. The battery will have an annual capacity of 372,000 tons. The project will be completed early next year.

The company has 2,012,000 tons of cokemaking capacity at its nearby Campbell Works.

Structural Shapes . . .

Structural Shape Prices, Page 146

Structural steel bookings of 294,860 tons surged to a nine month high during April, reports the American Institute of Steel Construction. This represents an increase of 42 per cent over bookings in the like period last year, and was about 40,000 tons larger than in the preceding month.

Total bookings for the first four months this year amounted to 1,079,730 tons, 44 per cent greater than in the same period last year.

April shipments were 290,623 tons, highest since November, 1958. The total for the first four months was 991,500 tons, 21 per cent below that for the same 1958 period.

Backlogs as of Apr. 30 stood at 1,921,929 tons. Of this, 1,201,689 tons were scheduled for fabrication during the period ending Aug. 31.

Wide flange beams are setting the market pace. Orders are brisk at Pittsburgh, and third quarter bookings will probably be equivalent to 75 per cent of capacity. The outlook for standard structurals depends largely on railroad buying. To date, the carriers haven't done much ordering.

Demand is off currently, reflecting in part the uncertainty of the steel labor outlook this summer. Earlier this year, there was a spurt of activity as builders rushed to get some strike hedge tonnage on mill books. But orders have tapered off, some fabricators being satisfied they will have 30 to 60 day stocks by July 1.

Pig Iron . . .

Pig Iron Prices, Page 151

Pig iron demand is increasing, due to heavier buying by foundries which are booking more business. Casting shops have started to accumulate stocks as a protection against a possible steel strike.

Demand may soar in the last half of June if a steel strike appears imminent. Sellers look for some decline in business in July due to vacations.

Merchant iron producers are op-

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erating close to capacity, stockpiling as much iron as possible and shipping large tonnages against current orders.

Interlake Iron Corp., Cleveland, will build a 3000 ton sintering plant at its Chicago merchant pig iron production facilities. It will process iron ores, coke, flue dust, and limestone into a premixed charge for its two Chicago blast furnaces. When full operation of the plant is reached, self-fluxing sinter is expected to comprise 80 to 90 per cent of the Chicago blast furnace burden. Completion is scheduled for September, 1960.

Iron Ore . . .

Iron Ore Prices, Page 152

Stocks of iron ore in furnace yards and on docks in the U. S. and Canada at the end of April totaled 37,794,197 gross tons vs. 49,628,458 at the end of April a year ago, reports the American Iron Ore Association.

Stocks break down as follows: U. S. Lake Superior ore, 20,667,890 tons vs. 31,577,844 last year; other U. S. ore, 3,267,970 tons vs. 3,416,314; Canadian Lake Superior, 504,916 vs. 986,831; other Canadian ore, 3,568,755 tons vs. 4,766,117; other foreign ore, 9,784,666 tons vs. 8,881,352.

Consumption of iron ore in the U. S. and Canada during April amounted to 12,111,179 gross tons, up sharply from the 6,351,682 tons consumed in the like month of 1958.

The breakdown of consumption by sources: U. S. Lake Superior ore, 6,934,383 tons vs. 3,326,072 in April, 1958; other U. S. ore, 1,637,201 vs. 1,116,676; Canadian Lake Superior ore, 348,802 vs. 237,675; other Canadian ore, 933,860 vs. 528,598; other foreign ore, 2,256,933 vs. 1,142,661 tons.

Consumption in the first four months of this year totaled 44,686,680 tons vs. 28,605,232 tons in the like period last year.

At the end of April, 243 blast furnaces were active in the U. S. and Canada out of a total 276. That compares with 151 active stacks at the end of April a year ago.

Iron Ore Statistics—April, 1959

(Gross tons)

Stocks of Ore and Agglomerates Held at Furnaces and Docks

Stocks at	U. S. Iron Ores L. Superior	U. S. Iron Ores Other	Canadian Iron Ores L. Superior	Canadian Iron Ores Other	Foreign Ores	Total April
U. S. Furnaces:						
Eastern	2,466,449	220,458	76,096	805,211	3,882,676	7,450,890
Pitts.-Valley	4,552,865	31,245	262,592	1,109,420	3,264,656	9,220,778
Cleve.-Detroit	4,874,930	119,538	58,876	201,355	409,033	5,663,732
Chicago	5,509,350	(a)	(a)	.....	(a)	5,509,350
Southern	(a)	1,967,570	.....	(a)	2,172,632	4,140,202
Western	.....	929,159	.....	.....	.....	929,159
Total	17,403,594	3,267,970	397,564	2,115,986	9,728,997	32,914,111
At U. S. Docks:						
Lake Erie	2,266,299	.....	75,478	1,206,916	.....	3,548,693
Other	.....	.....	.....	(a)	(a)	(a)
Total	2,266,299	.....	75,478	1,206,916	(a)	3,548,693
Total U. S.	19,669,893	3,267,970	473,042	3,322,902	9,728,997	36,462,804
Canadian	997,997	.....	31,874	245,853	55,669	1,331,393
Total U. S. and Canada	20,667,890	3,267,970	504,916	3,568,755	9,784,666	37,794,197

Consumption of Ore and Agglomerates in U. S. and Canada

(Gross tons)

Districts:	U. S. Iron Ores L. Superior	U. S. Iron Ores Other	Canadian Iron Ores L. Superior	Canadian Iron Ores Other	Foreign Ores	Total April
Eastern	796,493	196,799	21,841	302,161	1,053,663	2,370,957
Pitts.-Valley	2,192,199	128,430	129,778	429,897	758,613	3,638,917
Cleve.-Detroit	1,305,874	76,691	97,189	60,298	159,578	1,699,630
Chicago	2,324,427	(a)	(a)	.....	(a)	2,324,427
Southern	(a)	552,892	.....	(a)	270,419	823,311
Western	.....	682,389	.....	.....	.....	682,389
In U. S.						
Blast furnaces	4,977,610	1,029,072	225,817	481,491	777,020	7,491,010
Steel furnaces	184,366	81,779	218	11,532	604,094	881,989
Sintering (1)	1,452,148	525,924	22,773	299,333	860,776	3,160,954
Miscellaneous (2)	4,869	426	.....	.....	383	5,678
Total U. S.	6,618,993	1,637,201	248,808	792,356	2,242,273	11,539,631
In Canada						
Blast furnaces	251,947	.....	78,974	95,385	.....	426,306
Steel furnaces	1	.....	.....	20,514	14,660	35,175
Sintering (1)	63,442	.....	21,020	25,605	.....	110,067
Miscellaneous (2)	.....	.....	.....	.....	.....	.....
Total Canada	315,390	.....	99,994	141,504	14,660	571,548
Total U. S. and Canada	6,934,383	1,637,201	348,802	933,860	2,256,933	12,111,179

1—Consumed in sintering plants not located at mine site.
2—Sold to nonreporting companies or used for purposes not listed.
a—Included in other districts.
Data from American Iron Ore Association.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

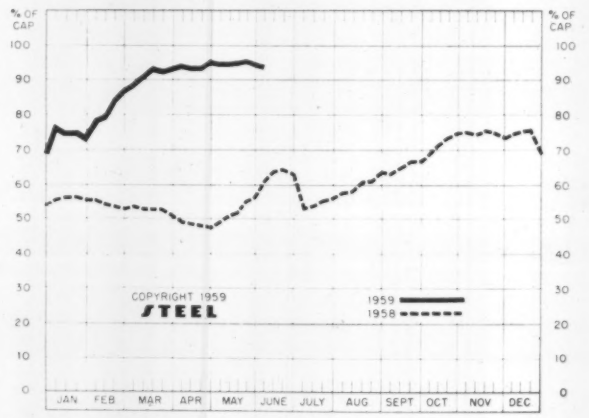
	Week Ended June 7	Change	Same Week 1958	Same Week 1957
Pittsburgh	96	+ 1*	59	87.5
Chicago	94	— 0.5	67.5	89.5
Eastern	96	— 1	58	94
Youngstown	95	— 1	49	70
Wheeling	91	— 2.5	74	92.5
Cleveland	95	+ 2*	36.5	88
Buffalo	107.5	0	53.5	95
Birmingham	97	+ 1.5	67	92.5
Cincinnati	95	+ 2*	60	93
St. Louis	104	0*	97	89.5
Detroit	95.5	— 2.5	68	96
Western	98	+ 3	74	100
National Rate	94	— 0.5	60.5	88

INGOT PRODUCTION‡

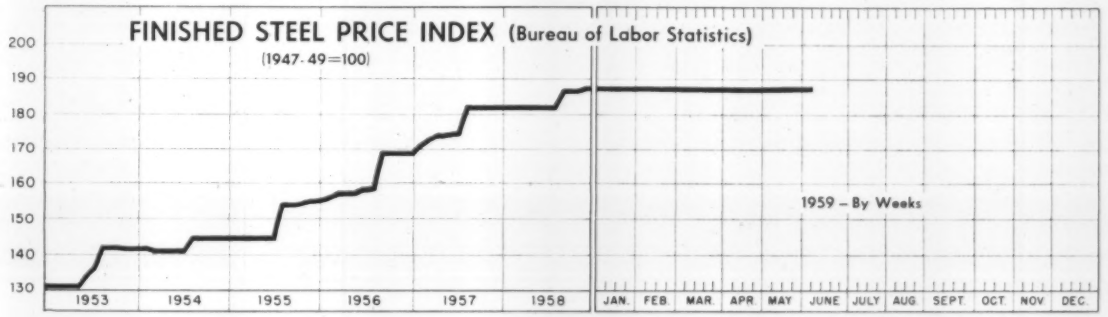
	Week Ended June 7	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	166.5†	165.0	162.1	104.9
NET TONS (In thousands)	2,674†	2,650	2,604	1,685

*Change from preceding week's revised rate.
†Estimated. ‡American Iron & Steel Institute.
Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



June 2, 1959	Week Ago	Month Ago	May Avg.	Year Ago
186.7	186.7	186.7	186.7	181.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 2

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200	Black Plate, Canmaking Quality (95 lb base box)	7.900
Tubing, Mechanical, Carbon (100 ft)	27.005	Wire, Drawn, Carbon	10.575
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608	Wire, Drawn, Stainless, 430 (lb)	0.665
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100	Bale Ties (bundles)	7.967
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800	Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.722
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	June 3 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.75
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.70
No. 2 Fdry, Pig Iron, GT.	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	35.00	34.00†	33.67	36.17	28.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	June 3 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate(1.50 lb)box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	June 3 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$34.50	$34.50	$34.50	$36.50	$30.50
No. 1 Heavy Melt, E. Pa.	36.00	33.50	33.50	34.50	23.00
No. 1 Heavy Melt, Chicago	34.50	34.00	33.00	37.50	32.00
No. 1 Heavy Melt, Valley	39.50	37.50	35.50	36.50	29.50
No. 1 Heavy Melt, Cleve.	36.50	35.50	33.50	33.00	28.50
No. 1 Heavy Melt, Buffalo	33.50	31.50	32.50	26.50	26.50
Rails, Rerolling, Chicago	58.50	57.50	56.50	56.50	44.00
No. 1 Cast, Chicago	49.50	49.50	46.50	41.50	38.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill Code prices as reported to STEEL, June 3, cents per pound except as otherwise noted. *Changes shown in italics.* number following mill point indicates producing company. Key to producers, page 147; footnotes, page 149.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 .. 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 .. 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 .... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 .. 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 .. 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 .. 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 .... $119.00
Bridgeport,Conn. C32 .. 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 .. 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 121.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 .. 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 .. 119.00
S.Duquesne,Pa. U5 .. 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 .. 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 .... 5.05

WIRE RODS
AlabamaCity,Ala. R2 .. 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 .... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 .. 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 .... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 .... 6.65
Monessen,Pa. P7 ..... 6.40
N.Tonawanda,N.Y. B11 .. 6.40
Pittsburg,Calif. C11 .... 7.20
Portsmouth,O. P12 .... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 .. 6.40
SparrowsPoint,Md. B2 .. 6.50
Sterling,Ill.(1) N15 .... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 .... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 .. 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 .. 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 .... 5.60
Lackawanna,N.Y. B2 .. 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 .... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 .... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14 .. 5.50
S.SanFrancisco B3 .... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 .... 6.20
Weirton,W.Va. W6 .... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.55
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2 .. 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 .... 5.55
S.Chicago,Ill. U5 ..... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W6 .... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 .. 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 .. 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 .... 8.15
Lackawanna,N.Y. B2 .. 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14 .. 8.05
S.SanFrancisco B3 .... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 .... 8.05
Lackawanna,N.Y. B2 .. 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 .... 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 .. 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 .... 6.50
Lackawanna,N.Y. B2 .. 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 .. 6.50
Weirton,W.Va. W6 .... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 .. 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 .. 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30)K1 .. 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 .... 5.40
Harrisburg,Pa. P4 .... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 .. 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 .. 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 .... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 .. 5.30
SparrowsPoint,Md. B2 .. 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 .... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 .... 5.30
Youngstown (27) R2 .... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 7.05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 .. 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 .. 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 .. 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1 .. 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14 .. 7.95
SparrowsPoint,Md. B2 .. 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 .... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L7 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14 .. 7.50
SparrowsPoint,Md. B2 .. 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 .. 6.375
Ind.Harbor,Ind. I-2 .... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 .. 5.55
Ashland l.c.l.(15) A10 .. 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 .. 5.675
Aliquippa,Pa. (9) J5 .. 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 .. 5.675
Birmingham(9) C15 .. 5.675
Buffalo(9) R2 ..... 5.675
Canton,O. (23) R2 .... 6.15
Clairton,Pa.(9) U5 .. 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 .... 5.675
Emeryville,Calif. J7 .. 6.425
Fairfield,Ala.(9) T2 .. 5.675
Fairless,Pa.(9) U5 .... 5.825
Fontana,Calif.(9) K1 .. 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 .. 5.675
Johnstown,Pa.(9) B2 .. 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5 .. 5.925
Lackawanna(9) B2 .... 5.675
LosAngeles(9) B3 .... 6.375
Massillon,O. (23) R2 .. 6.15
Midland,Pa.(23) C18 .. 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 .. 6.125
Niles,Calif. P1 ..... 6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro,Ky.(9) G8 .. 6.025
Pittsburg,Calif.(9) C11 .. 6.375
Pittsburgh(9) J5 .... 5.675
Portland,Oreg. O4 .... 6.425
Riverdale,Ill.(9) A1 .. 5.675
Seattle A24, B3, N14 .. 6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5 .. 5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15 .. 5.675
Sterling,Ill.(9) N15 .. 5.775
Struthers,O.(9) Y1 .... 5.675
Tonawanda,N.Y. B12 .. 5.675
Torrance,Calif.(9) C11 .. 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 .. 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .... 6.775
Bethlehem,Pa. B2 .... 6.725
Bridgeport,Conn. C32 .. 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 .... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 .. 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 .... 6.975
Lackawanna,N.Y. B2 .. 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 .... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 .... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 .... 8.55
Lackawanna,N.Y. B2 .. 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14 .. 8.30
S.Duquesne,Pa. U5 .... 8.30
S.SanFrancisco B3 .... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 .. 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9)S5 .. 5.925
Lackawanna(9) B2 .... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 .. 5.675
Tonawanda,N.Y. B12 .. 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 .... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 .... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra)
Carbon
LosAngeles P2, S30 .. 11.75*

Alloy
Ambridge,Pa. W18 .. 10.175
BeaverFalls,Pa. M12 .. 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 .... 10.35
SpringCity,Pa. K3 .... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .... 7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 .... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 .... 7.65
Gary,Ind. R2 ..... 7.65
Green Bay,Wis. F7 .... 7.65
Hammond,Ind. J5, L2 .. 7.65
Hartford,Conn. R2 .... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 .... 9.10
LosAngeles(49) P2, R2 .. 9.10
Mansfield,Mass. B5 .... 8.20
Massillon,O. R2, R8 .... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 .... 8.10
NewCastle,Pa.(17) B4 .. 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 .... 7.90
Putnam,Conn. W18 .... 8.20
Readville,Mass. C14 .... 8.20
S.Chicago,Ill. W14 .... 7.65
SpringCity,Pa. K3 .... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 .... 8.15
Youngstown F3, Y1 .... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 9.025
BeaverFalls,Pa. M12,R2 9.025
Bethlehem,Pa. B2 .... 9.025
Bridgeport,Conn. C32 .. 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 .... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 .... 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 .... 9.025
Hammond,Ind. J5, L2 .. 9.025
Hartford,Conn. R2 .... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 .. 9.025
LosAngeles P2, S30 .. 11.00
Mansfield,Mass. B5 .... 9.325
Massillon,O. R2, R8 .... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 .... 9.225
S.Chicago,Ill. W14 .... 9.025
SpringCity,Pa. K3 .... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 .. 9.325
Worcester,Mass. A7 .. 9.325
Youngstown F3, Y1 .. 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse, Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 .....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2 ..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated; To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ...5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ..5.575
Tonawanda(4) B12 ...6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2 Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2 ..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 .....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ...6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 .....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 .....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875†
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875†
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 .....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ....6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 .....6.975‡
MartinsFerry,O. W10 .6.75*
Middletown,O. A10 ....6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 .....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ...6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 .....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ..8.70
Ind.Harbor, Ind. I-2 ..8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 .....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 .....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H.K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackawanna,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago,Ill. W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind. Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
Los Angeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
NewBritain,Conn. S5	7.875

Strip, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Rivedale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.85	22.95	27.80
Buffalo W12	...	...	18.85	....	....
Fostoria,O. S1	...	...	19.05	22.15	....
FranklinPark,Ill. T6	...	...	19.20	23.30	28.15
Harrison,N.J. C18	...	...	18.85	22.95	27.80
NewYork W3	...	...	18.85	22.95	27.80
Palmer,Mass. W12	...	...	18.85	....	....
Trenton,N.J. R5	...	...	18.85	22.95	27.80
Worcester,Mass. A7, T6	...	...	18.85	22.95	27.80
Youngstown S41	...	...	19.20	23.30	28.15

Weirton,W.Va. W6	10.80
Youngstown Y1	10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C. R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)

IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, aBse Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Beech Bottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
Granite City,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70 ....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70 15.70
Warren,O. R2	....	....	....	....	....	.... 15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	9.75
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Worcester,Mass. A7, J4, T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Moneasen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N. J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S. Chicago,Ill. R2	173
SparrowsPt. Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
Sparrows Pt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automotic Baler (14½ Ga.)(per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S. Chicago, Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9 69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
PittsburgCalif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80‡‡
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48)	85.9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(1)(48)N15	9.00 9.70§§
Struthers,O. Y1	9.00 9.65†
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0

⅝ in. thru 1 in.:

6 in. and shorter	37.0
Longer than 6 in.	31.0

1⅛ in. and larger:

All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread)& Undersize Body (rolled thread)

½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer length	35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85, ⅞ in. and smaller by 6 in. and shorter: 15.0%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2¼	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9 10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 8-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa. deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb pigiets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††	Structural Shapes	Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.06	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.50	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [5]—1000 to 4999 lb; [10]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill. Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

—Inches— Diam	Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5½	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10§
40 mesh, bags	8.10††
Electrolytic Iron,	
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed, cl. 38.50; ton lots 40.50.	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.50-51.00†
Bronze, 5000-lb lots	52.40-56.40†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	53.00-57.30†
Phosphor-Copper, 5000-lb lots	64.80
Copper (atomized) 5000-lb lots	45.30
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten: Carbon reduced, 98.8% min. minus 65 mesh	Dollars nom.**
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.	
Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00
Cents per lb, f.o.b. tank cars or tank trucks, deld.	
Phenol, 90 per cent grade	14.75
Per net ton bulk, f.o.b. cars or trucks, plant	
Ammonium sulfate, regular grade	$32.00

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.80	$5.75	$5.65	$6.11
Bar Size Angles	5.30	5.25	5.10	5.56
Structural Angles	5.68	5.63	5.53	5.98
I-Beams	5.31	5.31	5.21	5.65
Channels	5.26	5.26	5.16	5.60
Plates (basic bessemer)	5.65	5.60	5.50	5.96
Sheets, H.R.	8.30	8.30	8.10	8.60
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.52	9.47	9.37	9.83
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.58	9.53	9.43	9.89
Sheets, C.R. (drawing quality)	8.75	8.75	8.60	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.68	6.58	6.52	6.75
Merchant Bars	5.90	5.85	5.65	6.11
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.70	5.70	5.50	5.85
Wire Rods, O.H. Cold Heading Quality No. 5	6.30	6.30	6.20	6.55
Bright Common Wire Nails (§)	7.65	7.65	7.65	7.95

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

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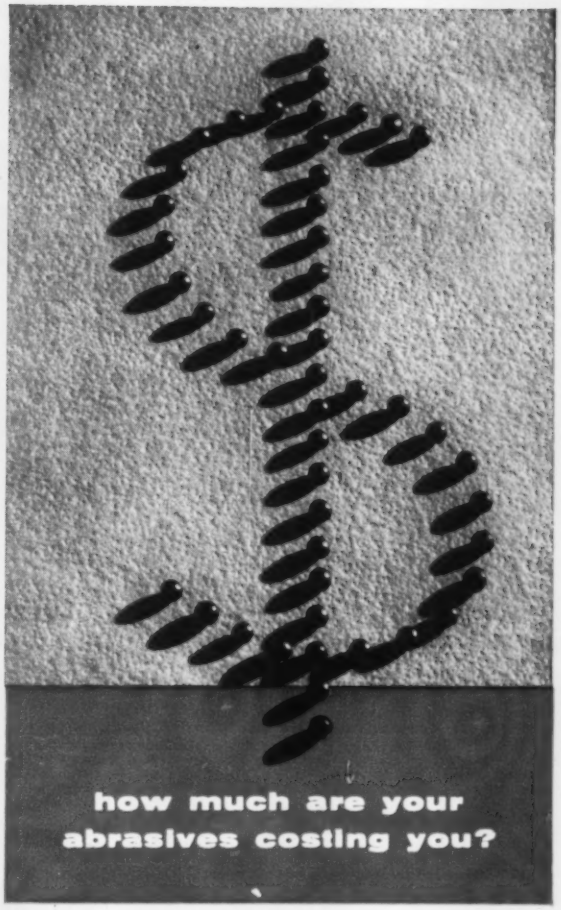

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MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. Charge Chrome 2: Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. Refined Chrome 2: Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload bulk 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices. **65% Ferrosilicon:** Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14 % B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, caload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosporus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo., in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

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TO BE SOLD ON THE PREMISES—TO THE HIGHEST BIDDERS

TUESDAY, JUNE 23, 1959 AT 11 A.M. DST

The Public Service Electric & Gas Co. is ceasing the manufacture of coal gas at their Camden Coke Plant. All equipment used in this process is being liquidated. Certain coke processing and handling equipment is being retained until the disposal of the present stock of coke is completed.

American Pulverizer Ring Mill Crusher, type 38-S, 150/300 tons-per-hr. capacity. Penn Hammermill, size SXT-12, 125-tons-per-hr. Koppers Oven Charging Larry Cars, 10 ton capacity. Koppers Hydraulic Door Machines. Latimer Coal Spillage Bucket Elevator, 50 tons per hr., crushed coal Koppers Coke Oven Pusher 1947, 34′ C to C gauge, Atlas electric Coke Quenching Locomotive, standard gauge. Tippett & Wood Steel Sludge Settling Tanks, 42′ height. Steel Water Scrubbers 12′ diameter x 70′ height. Koppers steel inclined Drum Rotary Kiln, 4′ diameter x 30′ length. "Fluor Counter Flo" Cooling Tower 1954, Redwood with stainless steel fasteners. Koppers Elex Precipitator 8′5″ x 26′2″ height. Otis Elevator 118′6″ high travel, car size 2′10″ x 4′ x 7′4″ height. Complete Natural Gas-Air Jet Plant, 8 Schutte-Koerting Jets with rated capacity with 40-lb. gas; to produce 400 M-CFH, of 575 BTU gas. Five United Engineering Primary Coolers, 7′ diameter x 30′6″ height, Tar Decanter Separator 20′ x 46′ x 10′6″ deep. I-R Gas Compressors, duplex and compound types, I-R Turbo Exhausters 11,000–17,000 CFM capacity. Other Processing Equipment includes 2 Builders Coal Providence Proportioning and Weighing Equipment. Latimer Steel Bucket Elevator 15.2 tons-per-hr. Howe Larry Scale type 10-60. Koppers Hydraulic Door Machines, Koppers Steel Quenching Cars, Koppers and Barnes Coke Oven Gas-Air Reversing Mechanism. Hydraulic Door Jack. 2 Cottrell Gas Precipitators, Packaged Units designed to handle approx. 2 million cubic ft. coke oven gas per day. Patterson Hot Water Storage Heater, 500 gal. I-R, Elliott, and Alberger Barometric Condensers, 5,000/40,000 lbs. steam per hr. Sharples Sulphate Dehydrator Dryer Type C-20, 6 Andale After coolers, style 22 x A-12. Koppers Centrifugal Driers, 40″ basket. Hungerford & Terry Sand Filter, Research Engineering Mechanical Rectifiers, Koppers Ammonia Condenser, and Ammonia Still. Struther-Wells Heat Exchanger. United Filter Press, Sager Mud Mill, Lifting Magnets, and asstd. Rubber belt, steel Roller Conveyor Units, 13′11″ to 310′ long, 24″ to 42″ wide. Miscellaneous Plant Equipment includes: Terry 200 k. w. Steam Turbine, I-R single stage Air Compressors. Centrifugal, Reciprocating, Oil and Water Pumps, asstd. sizes. Large Steel Tanks, Recording Instruments, Generators, 956 New Cooler Tubes, 2″ diameter, 24′ long, #10 B-W gauge, C. I. Gas Valves 50 lb. and Machine Spare Parts. Rahn Larmon Gap Lathe, 24/48″ Swing x 6′ Gap, 16′ long. Landis heavy duty Pipe Threader 12″ capacity. Nat'l Bolt Threader, Cleveland Openside Planer 30″ x 8′ table, Nazel hydraulic Hammer size 4-D, Radial Drill, Toledo Hacksaw, Blount Grinder, Portable Electric Welders, small Bandsaw, Chain Falls, Pulley Blocks, Portable Electric Drills, Chipping and Scaling Hammers, Grease Gun Equipment, Space Unit Heaters, Fire Extinguishers, etc.

Exhibition: June 17, 18, 19 & 22 from 10 A.M. to 4 P.M. or by appointment

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Scrap Market Gathering Strength

STEEL's composite on No. 1 heavy melting rises $1 a ton to $35 despite limited mill buying. Upturn largely reflects improved sentiment among brokers and dealers

Scrap Prices, Page 158

• **Philadelphia**—Increasing scarcity of supplies is causing a further stiffening in domestic steel scrap prices. No. 1 heavy melting is higher at $36, delivered, No. 1 bundles at $38, No. 2 bundles at $23, No. 1 busheling at $37, and electric furnace bundles at $39. No. 2 heavy melting fell slightly, now being quoted at $30.

There has been no recent buying of No. 1 heavy melting by domestic consumers. But activity in the export market has boosted the price they would have to pay for metal. Two boats are loading here, and two more are expected to pick up full cargoes later this month. The pressure for scrap for foreign shipment has virtually cleaned out some district yards.

• **New York**—Some improvement in domestic demand and moderately good business from abroad have caused brokers to advance their buying prices for No. 1 heavy melting to $28-$29, No. 2 heavy melting $25-$26, No. 1 bundles $28-$29, and low phos structurals and plates $36-$37. Each grade is up $1 a ton.

• **Pittsburgh** — Threatened by a strike, steelmakers are taking in only as much scrap as they'll need to round out first half production. Most buys for June have been made, but dealers are optimistic. Reason: Fisher Body Div., General Motors Corp., sold its factory bundles for $43.50-$44 a ton, about $3 more than a month ago. Despite talk of a stronger market, mills are still buying small quantities of No. 1 heavy melting at $35. If more than 20,000 tons were needed, the price would be closer to $40.

• **Chicago**—Since the gain of $2 a ton a week ago, mill buying has been virtually nonexistent. So a price test is lacking. One important mill has announced $35 as its June buying price for No. 1 industrial heavy melting. There is a question as to how much tonnage this figure will attract because brokers are said to be giving dealers $36. The recent market rise was sparked by bids of two auto stampers for No. 1 industrial bundles at $42 to $42.50, delivered, an advance of around $4 a ton for the grade. Little scrap activity is expected the balance of this month.

• **Cleveland**—The market tone is a little stronger, but not much buying by the mills is expected until the labor contract issue is out of the way. Expectations are the mills will begin to cut off shipments around midmonth if it looks as though a strike is certain at the end of the month.

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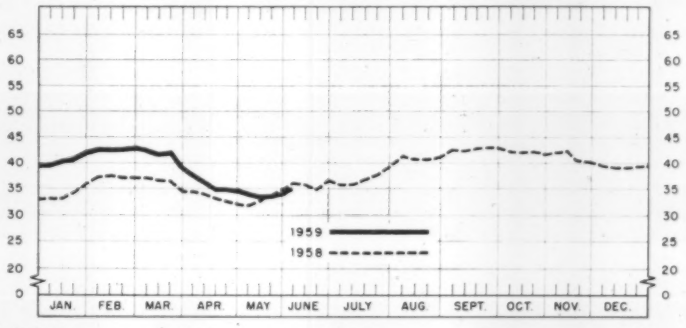
STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.



June 3 1959	Week Ago	Month Ago	Year Ago	May Avg.
$35.00	$34.00*	$33.67	$36.17	$33.58

*Revised.

• **Detroit**—Prices moved up slightly here following the closing of the automotive lists. It looks like the market will hold fairly steady, though dealers and brokers will not be surprised if prices drop toward the end of the month, possibly as much as $3 a ton.

• **Buffalo**—New strength is developing in the local market, and dealers now look for a price increase of $2 to $3 a ton on the leading steel grades. The improved situation largely reflects betterment at other consuming centers. Shipments probably will be embargoed after midmonth if it looks like a strike is certain. Supplies are shrinking as result of slower collections.

• **Cincinnati** — Though buying is spotty, the mills last week paid $1 to $2 a ton more for scrap. The new strength probably will be shortlived since the mills are expected to shut off intake about midmonth. One large area mill that would not be affected by a strike at the end of the month is taking in normal tonnage.

• **St. Louis**—Although prices are steady, the market is showing signs of strength. Not much scrap is moving to dealers, and if they want more, they'll have to pay more for it. Mill demand is stiffening slightly. A steel strike could cause a greater flow of material and steady prices. If supplies continue tight, prices will probably rise.

• **Birmingham** — Except for rails, the scrap grades are stronger in this district. The Atlanta mill raised its prices $4 per ton over its last purchases, and a Birmingham electric furnace operator offered $2 a ton more than it did in May. The cast iron scrap market is firm. Some foundries are buying imported pig iron.

• **Houston** — Except for southern Texas, where strong Mexican demand and slow intake of country scrap make for a tight situation, there is no significant change in market activity. Texas mills are not buying. They hold large inventories. A recent Japanese purchase of 86 cargoes of scrap has given rise to speculation that there may be an upturn in export activity. So far, however, exporters have not moved into the Houston area for material.

• **Seattle**—Local market conditions have changed but slightly, though some new orders have been placed by the Japanses. Domestic buying continues to be spotty.

In the Vancouver, B. C., area, prices compare favorably with those quoted in the Pacific Coast states. Not much scrap is generated in western Canada, and increasing competition for the available supply is indicated with the approaching completion of a mill in Saskatchewan. The mill in Alberta is absorbing the scrap output of that area.

• **Los Angeles**—The mills are buying only for immediate needs and indications are the movement of tonnage will be limited until the labor uncertainty is cleared up. Yard inventories are rising.

• **San Francisco**—The price of No. 1 bundles dropped $1 a ton last week, now being quoted at $33. Other grades of steel scrap held unchanged.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

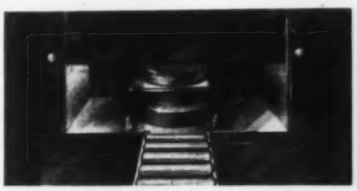
14,000 tons, transmission tower steel for Bonneville Power Administration, to Societa Nomina Electrificazione, Milan, Italy.

1566 tons, Sumner tunnel, Boston, to Commercial Shearing & Stamping Co., Youngstown; Perini Corp., Framingham, Mass., general contractor; 2000 tons, reinforcing bars, and 300 tons of bolts to be placed.

1200 tons, slide gates and fabricated appurtenances, Black Butte project, Stony Creek, U. S. Engineer, near Orland, Calif., to Willamette Iron & Steel Co., Portland, Oreg.

922 tons, state bridgework, Sec 8, Farmhurst, Del., through Berger Construction Co., general contractor, to Meyer-Pollock Inc., Pottstown, Pa.

(*Please turn to Page* 163)



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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, June 3, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

June 3	$35.00
May 27	34.00*
Apr. Avg.	34.96
May 1958	33.21
May 1954	28.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania. *Revised.

PITTSBURGH

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	30.00-31.00
No. 1 dealer bundles	38.00-39.00
No. 2 bundles	25.00-26.00
No. 1 busheling	38.00-39.00
No. 1 factory bundles	*44.00-45.00*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals:	
2 ft and under	43.00-44.00
3 ft lengths	42.00-43.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	45.00-46.00
Electric furnace bundles	42.00-43.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 2 ft and under	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Random rails	48.00-49.00
Angles, splice bars	48.00-49.00
Railroad specialties	47.00-48.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	35.00-36.00
No. 1 hvy melt., dealer	*33.00-34.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 factory bundles	*41.00-42.00*
No. 1 dealer bundles	*34.00-35.00*
No. 2 bundles	24.00-25.00
No. 1 busheling, indus.	35.00-36.00
No. 1 busheling, dealer	*33.00-34.00*
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3 ft	*43.00-44.00*
Punchings & plate scrap	*44.00-45.00*

Cast Iron Grades

No. 1 cupola	49.00-50.00
Stove plate	46.00-47.00
Unstripped motor blocks	41.00-42.00
Clean auto cast	56.00-57.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00-40.00*
R.R. malleable	59.00-60.00
Rails, 2 ft and under	*55.00-56.00*
Rails, 18 in. and under	*56.00-57.00*
Angles, splice bars	48.00-49.00
Axles	*65.00-66.00*
Rails, rerolling	*58.00-59.00*

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*39.00-40.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 busheling	*39.00-40.00*
No. 1 bundles	*39.00-40.00*
No. 2 bundles	*25.00-26.00*
Machine shop turnings	17.00-18.00
Short shop turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	*42.00-43.00*
Electric furnace bundles	*42.00-43.00*

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

CLEVELAND

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 factory bundles	*41.00-42.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	*39.00-40.00*
Cut structurals, plates 2 ft and under	*43.00-44.00*
Low phos. punchings & plate	*39.00-40.00*
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	*39.00-40.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	50.00-51.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	*125.00-130.00*
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	21.00
No. 1 busheling	37.00
Machine shop turnings	*14.00*
Short shovel turnings	*16.00*

Cast Iron Grades

No. 1 cupola	*50.00*
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	*51.00*
Stove plate	*46.00*

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Rails, 18 in. and under	49.00
Rails, random lengths	42.50
Rails, rerolling	51.00†
Angles, splice bars	*45.00*

BIRMINGHAM

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	21.00-22.00
No. 1 busheling	*29.00-30.00*
Cast iron borings	14.00-15.00
Machine shop turnings	*22.00-23.00*
Short shovel turnings	*24.00-25.00*
Bars, crops and plates	*40.00-41.00*
Structurals & plates	*39.00-40.00*
Electric furnace bundles	*36.00-37.00*
Electric furnace:	
3 ft and under	*34.00-35.00*
2 ft and under	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18 in. and under	*44.00-45.00*
Rails, rerolling	52.00-53.00†
Rails, random lengths	*39.00-40.00*
Angles, splice bars	42.00-43.00

PHILADELHIA

No. 1 heavy melting	*36.00†*
No. 2 heavy melting	*30.00*
No. 1 bundles	*38.00*
No. 2 bundles	*23.00*
No. 1 busheling	*37.00*
Electric furnace bundles	*39.00*
Mixed borings, turnings	20.00†
Short shovel turnings	22.00-23.00
Machine shop turnings	20.00
Heavy turnings	32.00-33.00
Structurals & plate	40.00-42.00
Couplers, springs, wheels	42.00-43.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	42.00
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	16.00-17.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates)	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	*33.00-34.00*
No .2 heavy melting	*28.00-29.00*
No. 1 bundles	*33.00-34.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	*33.00-34.00*
Short shovel turnings	*21.00-22.00*
Machine shop turnings	*17.00-18.00*
Short shove lturnings	*21.00-22.00*
Cast iron borings	*19.00-20.00*
Low phos structurals and plate, 2 ft and under	*43.00-44.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	48.00-49.00

Railroad Scrap

Rails, random lengths	*45.00-46.00*
Rails, 3 ft and under	*51.00-52.00*
Railroad specialties	*43.00-44.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	32.50-33.50
No. 2 heavy melting	27.50-28.50
No. 1 bundles	32.50-33.50
No. 2 bundles	*23.00-24.00*
No. 1 busheling	32.50-33.50
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*16.00-17.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*17.00-18.00*
Low phos., 18 in.	41.00-42.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	39.00-40.00
Charging box cast	38.00-39.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	*54.00-55.00*
Rails, random lengths	*47.00-48.00*

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	20.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	41.00

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	24.00
No. 2 heavy melting	20.00-20.50
No. 1 bundles	24.00-24.50
No. 1 busheling	24.00-24.50
Machine shop turnings	8.00-9.00
Short shovel turnings	10.00-11.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	20.00-21.00
No. 1 bundles	*33.00-34.00*
No. 2 bundles	19.00-20.00
No. 1 busheling	*31.00-32.00*
Machine shop turnings	12.00-13.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	13.00-14.00

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Stove plate	*35.00-36.00*
Charging box cast	*36.00-37.00*
Heavy breakable	*36.00-37.00*
Unstripped motor blocks	*24.00-25.00*
Clean auto cast	*50.00-51.00*

SEATTLE

No. 1 heavy melting	35.00
No. 2 heavy melting	33.00
No. 1 bundles	27.00†
No. 2 bundles	22.00
Machine shop turnings	17.00
Mixed borings, turnings	17.00
Electric furnace No. 1.	38.00†

Cast Iron Grades

No. 1 cupola	34.00
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	18.00
Machine shop turnings	17.00
Shoveling turnings	19.00
Cast iron borings	19.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	*33.00*
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.

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Market Is Strong, Stable

Over-all demand is running at the best level in two years. Prices are stable, profits up, stocks falling. Only serious labor troubles could halt continued recovery

Nonferrous Metal Prices, Pages 162 & 163

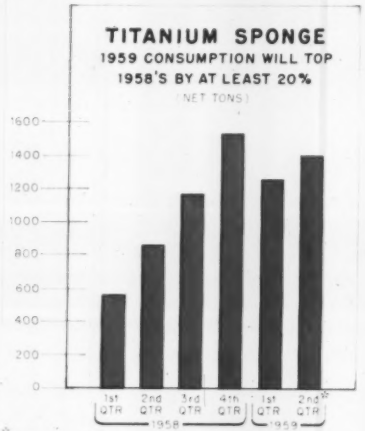
THE ROBUST HEALTH of the nonferrous market has driven the Gloomy Gusses and professional pessimists underground. Demand is good. Profits are going up. Prices appear to be stable. And producers' stocks are mostly falling. Only the threat of labor troubles in a few weeks mars the best general picture in over two years.

• **Copper** — Custom smelters and producers are booked through June. Some users are dissatisfied with the amount of metal they're able to obtain from those sources, but most aren't enough so to pay the 0.75 to 1.0 cent a pound premium dealers are asking. The situation seems to boil down to this: There's some tightness at the producers' level, but no actual copper shortage. It means production and consumption are pretty much in balance, but demand is running a little ahead of output due to inventory replenishment and some buying as a strike hedge. Clyde E. Weed, chairman of Anaconda Co., believes the copper supply will remain in "comfortable balance" this year, barring lengthy strikes in major industries.

Custom smelters are obtaining scrap in fair quantities and producing close to capacity. Their price of 32 cents a pound is strong but probably won't change soon. Producers won't touch their 31.5 cent price until the labor air clears.

• **Lead**—Shipments of refined metal jumped 12,000 tons in April to a nine year high of 52,649 tons. They brought domestic sales for the first four months to 157,349 tons compared with 108,311 tons in the same period last year, a gain of around 45 per cent. Even though April production was up (to 40,606 tons), refined stocks of U. S. producers fell to 197,823 tons, the lowest in five months.

Heavy demand in May probably pulled shipments for the month to over the April figure. Look for another reduction in stocks when figures are released around the middle of June.



*Estimated by STEEL
Source: U.S. Bureau of Mines

Early June sales have been good. Some metalmen think demand could taper off a little later in the month, but there have been few indications of that. The price appears stable at 12 cents a pound.

• **Zinc** — Buying continues at a rapid rate. The bulk of the June buying has been completed, and some substantial sales for July are reported. It's possible there will be some slackoff soon as buyers sit back and take a breather until they can see which way the labor situation is going. Look for the 11 cent a pound price to hold over the next few weeks.

• **Aluminum** — Primary production continues to shoot upward. For the third time in six weeks Kaiser Aluminum & Chemical Corp. has started up a potline. This time it's at Mead, Wash. Capacity: 22,000 tons yearly. Aluminum Co. of America has started up another potline at Alcoa, Tenn. Capacity: 12,000 tons a year. With these additions, STEEL estimates the domestic primary industry is operating at an annual rate of 2,003,500 tons.

Kaiser's reason: "The continuing strong market demand for primary aluminum and aluminum mill products," says vice president and general manager, D. A. Rhoades. Kaiser is operating at an annual level of 524,500 tons, an all-time high.

Aluminum demand has been spiraling over the last several months. Sales have climbed steadily since January. Latest figures from the Aluminum Association show April shipments of sheets and plates hit 135,529,000 lb compared with 129,291,000 lb in March. May business was even better, believes the industry, and it looks for operations to continue at a high level.

It's unlikely that sales are keeping pace with the rapid fire increases in production. The consensus among neutral metalmen is that the industry will see a sizable buildup in stocks over the year.

NONFERROUS PRICE RECORD

	June 3 Price	Last Change	Previous Price	May Avg	Apr. Avg	June, 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.900
Copper	31.50-32.00	Apr. 30, 1959	31.50-32.50	31.750	32.404	25.400
Lead	11.80	May 7, 1959	11.30	11.700	10.992	11.040
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	104.625	June 3, 1959	104.50	103.080	102.490	94.701
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 32.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 100 lb, $11 per lb; 100-500 lb, $9.50 per lb; 500 lb or more, $9 per lb. All prices deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $243-246 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 104.625.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.875-26.25; No. 12 foundry alloy (No. 2 grade), 22.75-23.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 26.25-27.00; 108 alloy, 23.25-23.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 20.75.

Brass Ingot: Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2 125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 25.00-25.50; No. 2 heavy copper and wire, 23.00-23.50; light copper, 21.00-21.50; No. 1 composition red brass, 19.00-19.50; No. 1 com-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes
Copper	55.63b	52.86c	....	55.82
Yellow Brass	48.24	32.73d	48.78	51.65
Low Brass, 80%	51.23	51.17	51.77	54.54
Red Brass, 85%	52.29	52.23	52.83	55.60
Com. Bronze, 90%	53.90	53.84	54.44	56.96
Manganese Bronze	56.54	50.14	60.62	....
Muntz Metal	50.85	46.16	....	....
Naval Brass	52.80	46.61	59.36	56.21
Silicon Bronze	60.67	59.86	60.21	78.35
Nickel Silver, 10%	63.82	66.15	66.15	....
Phos. Bronze	75.34	75.84	75.84	77.02

SCRAP ALLOWANCES e (Based on copper at 31.50c)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	27.500	27.500	26.750
Yellow Brass	20.625	19.750	18.750
Low Brass, 80%	23.250	23.000	22.500
Red Brass, 85%	24.250	24.000	23.500
Com. Bronze, 90%	25.125	24.875	24.375
Manganese Bronze	19.125	18.875	18.375
Muntz Metal	19.375	19.125	18.625
Naval Brass	19.125	18.875	18.375
Silicon Bronze	27.000	26.750	26.000
Nickel Silver, 10%	25.500	25.250	12.625
Phos. Bronze	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add .1 cent per lb.

position turnings, 17.25-17.75; new brass clippings, 17.50-18.00; light brass, 12.25-12.75; heavy yellow brass, 13.25-13.75; new brass rod ends, 15.00-15.50; auto radiators, unsweated 14.50-15.00; cocks and faucets, 15.50-16.00; brass pipe, 15.50-16.00.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.25-2.50; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.75-10.25.

Monel: Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-22.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 14.50-15.00; segregated high copper clips, 14.50-15.00; mixed low copper clips, 14.75-15.25; mixed high copper clips, 12.00-12.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.25-16.75; mixed low copper clips, 16.50-17.00; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.50-16.00; segregated high copper clips, 14.50-15.00; mixed low copper clips, 15.00-15.50; mixed high copper clips, 14.00-14.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 28.00; No. 2 heavy copper and wire, 26.75; light copper, 24.50; refinery brass (60% copper) per dry copper content, 26.25.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 28.00; No. 2 heavy copper and wire, 26.75; light copper, 24.50; No. 1 composition borings, 22.00; No. 1 composition solids, 22.50; heavy yellow brass solids, 16.50; yellow brass turnings, 15.50; radiators, 17.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 40.50, 2000-5000 lb lots; cast, 43.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 123.50; 200-499 lb, 122.00; 500-999 lb, 121.50; 1000 lb or more, 121.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.
Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.
Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 81.20; 100-600 lb, 71.70; 700-1900 lb, 69.00; 2000-9900 lb, 67.10; 10,000 lb or more, 65.80.

Stannous Chloride (Anhydrous): 25 lb, 156.80; 100 lb, 152.00; 400 lb, 149.50; 800-19,900 lb, 108.70; 20,000 lb or more, 102.60.

Stannous Sulphate: Less than 50 lb, 141.90; 50 lb, 111.90; 100-1900 lb, 109.90; 2000 lb or more, 107.90.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(Concluded from Page 157)

865 tons, four composite multiple span wide flange beam bridges, Waterbury, Vt., to Vermont Structural Steel Co., Burlington, Vt.; Lane Construction Co., Meriden, Conn., general contractor.

800 tons, reconstruction, Longfellow Bridge, Charles River, Boston, to West End Iron Works, Cambridge, Mass.; Beacon Construction Co., Boston, general contractor.

700 tons or more, intake gates, hoists, etc., Ice Harbor Dam, Snake River, to Guy F. Atkinson Co. and Willamette Iron & Steel Co., Portland, Oreg., at $217,428 to the U. S. Engineer.

585 tons, high school, Rockford, Ill., to Mississippi Valley Structural Steel Co., Melrose Park, Ill.; Sjostrom & Sons Inc., Rockford, general contractor; also 200 tons, joists, to Ceco Steel Products Inc., Chicago.

400 tons, steel sheet piling, foundations, Prudential Center Tower, Boston, to U. S. Steel Corp., Pittsburgh; George A. Fuller Co., Boston, general contractor; this is in addition to 3000 tons placed with Bethlehem Steel Co., Bethlehem, Pa.

360 tons, addition, Pittsfield General Hospital, Pittsfield, Mass., to James McKinney & Sons Inc., Albany, N. Y.; Daniel O'Connell's Sons Co., Inc., Holyoke, Mass., general contractor.

280 tons, junior and senior high school, Tussey Mountain, Pa., through R. S. Mowery & Sons, Carlisle, Pa., to Electro-Weld Co., Erie, Pa.

160 tons, hospital, University of Kentucky, Lexington, Ky., to Volunteer Structures Inc., Lexington; Foster-Creighton Co., Nashville, Tenn., general contractor.

125 tons, fruit warehouses, Wenatchee, Wash., to unstated interest.

STRUCTURAL STEEL PENDING

1210 tons, two state bridges, Butler County, Pennsylvania, bids June 7.

1200 tons, state bridgework, Sec. 9, Farmhurst, Del.; G. A. & F. C. Wagman, Dallastown, Pa., low on the general contract.

800 tons, Mercy Hospital, Wilkes-Barre, Pa.; bids closed June 4.

525 tons, Muhlenberg Medical Center, Bethlehem, Pa., L. F. Driscoll Co., Philadelphia, low on the general contract.

250 tons, I-beam bridge, Waterville-Fairfield, Maine; bids June 17, to Augusta, Maine.

198 tons, state bridgework, Indiana County, Pennsylvania; bids June 19.

130 tons, three-span composite wide flange bridge, Concord, N. H.; bids June 12 to Concord.

100 tons plus, pipe and testing equipment, Detroit Dam, Oregon; Willamette Iron & Steel Co., Portland, Oreg., low at $32,398 to U. S. Engineer.

90 tons, tunnel supports and miscellaneous, Mayfield Dam project, Cowlitz River, Washington State; bids to Tacoma, Wash., June 8.

Unstated, machine shop and utilities, Malmstrom Air Base, Montana; bids to U. S. Engineer, Seattle, June 19.

Unstated, Copper Lake, Alaska, powerplant for Chugach Electric Association, Anchorage, Alaska; Morrison-Knudsen Co., Seattle, is low at $1,551,501.

Unstated, Bomarc launchers, Paine Field, Washington State, and Adair Field, Oregon; bids to U. S. Engineer, Seattle, July 7 and July 9, respectively.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1250 tons, library, Cornell University, Ithaca, N. Y., to American Steel Engineering Co., Philadelphia; Perini Corp., Framingham, Mass., general contractor.

305 tons, addition, Pittsfield General Hospital, Pittsfield, Mass., to Mohawk Steel Co., Albany, N. Y.; Daniel O'Connell's Sons Co. Inc., Holyoke, Mass., general contractor.

800 tons, hospital, University of Kentucky, Lexington, Ky., to Pollak Steel Co., Cincinnati; Foster-Creighton Co., Nashville, Tenn., general contractor.

245 tons, health center, Fulton County, Atlanta, Ga., to Tech Steel Inc., Atlanta; George A. Fuller Construction Co., Atlanta, general contractor.

179 tons, Montana highway bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; Peter Kiewit & Sons Co., general contractor.

150 tons, reconstruction, Longfellow Bridge, Charles River, Boston, to Northern Steel Inc., Boston; Beacon Construction Co., Boston, general contractor.

135 tons, missile station installation, Clear, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Baker & Ford, Bellingham, Wash., general contractor.

100 tons, defense installation, Clear, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; Patti-MacDonald Construction Co., general contractor.

100 ton, high school, Rockford, Ill., to Ceco Steel Products Inc., Chicago; Sjostrom & Sons, Inc., Rockford, general contractor.

REINFORCING BARS PENDING

135 tons, state bridgework, Allegheny County, Pennsylvania; bids June 26.

125 tons, Washington State bridge, Whatcom County; general contract to Wilder Construction Co., Bellingham, Wash., low at $1,524,325.

80 tons, also lump sum for unstated shape tonnage, Montana highway span, Valley County; Roscoe Construction Co., Billings, Mont., low at $298,813.

Unstated, Oregon state highway projects, low bidders: Columbia County, two bridges, C. J. Montag & Sons, Portland, Oreg., $42,183; Jackson County, 183 ft deck girder span, R. & M. Construction Co., Central Point, $51,038; Lane County, lining Cape Creek tunnel, Teeples & Thatcher, Portland, Oreg., $100,500; Lane County, arches and interchanges, R. A. Heintz Construction Co., Portland, Oreg., $103,299.

PLATES . . .

PLATES PLACED

4200 tons, storage tanks, 10,000 barrel capacity, petroleum-oil-lubrication facilities, Bureau of Yards and Docks, Navy, Port Hueneme, Calif., to Columbian Steel Tank Co., Kansas City, Mo. ($891,588) and

CLASSIFIED

FOR SALE LESS THAN MILL PRICE
NEW PLATE

90 tons 5/16 x 18 x 72 nickel chrome moly SAE 8630 annealed, P. & O. on skids.

BARKSDALE MFG. CO.
Blytheville, Ark.

Help Wanted

GENERAL SUPERINTENDENT for progressive Central Florida Steel Plant. Fabricate structural, plate, sheet and miscellaneous steel 150 employees. Five departments. Must have proven experience and proficiency to organize, coordinate and direct production, cost and quality control. Maximum age 50. Only top-notch producer need apply. Good Salary. Excellent opportunity for advancement. Furnish complete resume and salary requirement. Reply Box 770, STEEL, Penton Bldg., Cleveland 13, Ohio.

METAL FINISHING SPECIALIST. Young college graduate, chemist or engineer preferred. Wanted for development of processing oils and lubricants to be marketed to metal working industries. Position offers unusually attractive growth potential with nationally recognized Eastern United States oil refiner expanding into new field of activity. State full background, education, experience, and salary requirements. Write Box 767, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Looking for the world's most complete stock of 52100 steel tubes and bars? You've come to the right spot . . . . . .

PETERSON STEELS, INC.
Union, New Jersey
Detroit, Michigan Chicago, Illinois

Black, Sivalls & Bryson Inc., Kansas City, Mo., ($768,610).

200 tons or more, two water tanks, Kent, Wash., to Chicago Bridge & Iron Co., Seattle, $61,126 and $49,873.

PIPE . . .

CAST IRON PIPE PLACED

1400 tons, Mercer Island, Washington, to U. S. Pipe & Foundry Co., Seattle; A. Jakoboni, Seattle, general contractor, $410,248.

138 tons, 6 to 18 in. for Tacoma and Mountlake Terrace, Washington State, to Pacific States Cast Iron Pipe Co., Seattle.

CAST IRON PIPE PENDING

150 tons, 4 to 12 in., for Auburn, Shelton, and Bellingham, Wash.; bids in.

125 tons, 12 in., King County District No. 20, Seattle; bids in.

New Pollution Headaches

The changing character of industry is bringing on new air pollution headaches, says Dr. Leslie Silverman, School of Public Health, Harvard University.

Among the more dangerous (and more annoying) problems, Dr. Silverman cited these:

- Industrial waste particles are smaller now and stay suspended in the atmosphere longer. Mean particle size has dropped to about 0.5 microns vs. 1 to 3 microns formerly. (A micron is 0.025 in., a human hair about 50 microns).
- Organic compounds and trace metals, like vanadium and manganese, are being discharged to a greater extent. After photochemical and atmospheric decay effects, they produce acid mists which are serious health menaces.
- Many plants have installed improper or inadequate equipment. Fumes attack filter materials, and separators are used for particles too small to be separated.
- Growth of the atomic energy industry will produce more uranium fumes which could be lethal.

Research is needed, says Dr. Silverman, to develop:

- Temperature resistant batteries for collecting gases from high temperature furnaces.
- Cheaper methods for the recovery of increasing quantities of sulfur gases in fossil fuels.
- Control of mobile air pollution sources, such as cars and trucks.
- Methods to control acid mists which develop around refineries and chemical plants.

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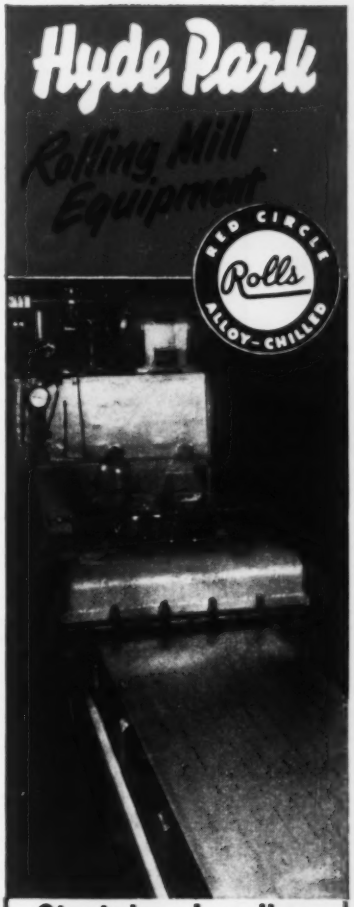


Stretcher Levellers

Complete range of stretching capacities from 150 to 750 tons, for levelling ferrous and non-ferrous sheets in sizes up to 120" wide x 500" long.

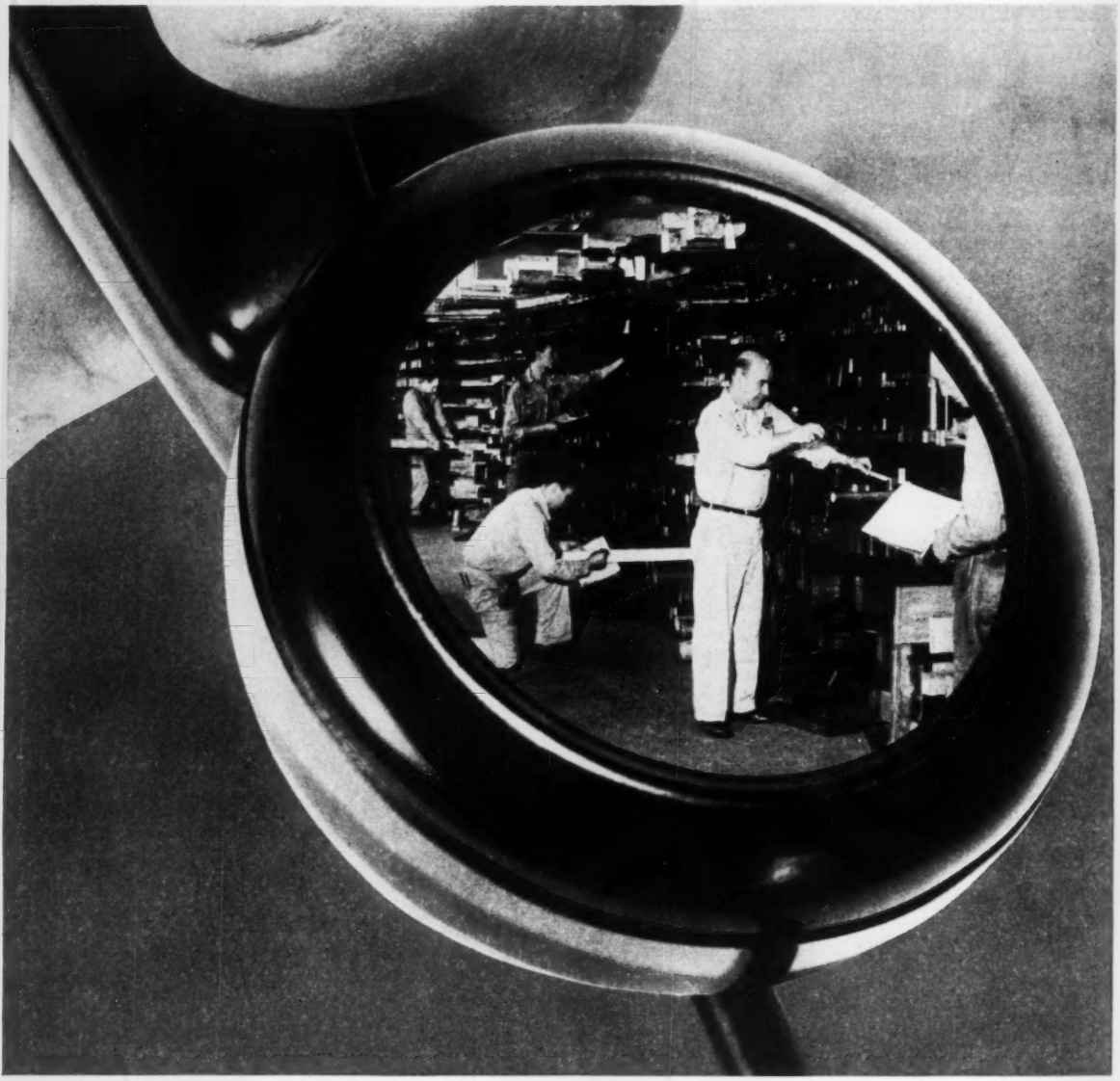
Speeds and length of "stretch" to meet all requirements.

Adaptable for automatic cycling.

Bar Mills • Merchant Mills • Sheet and Strip Mills • Pinion Stands
Roller Tables • Reduction Drives
Stretcher Levellers • Roll Lathes • Guillotine Shears
Special Machinery • Sheet Mill Shears • Machine Work

Hyde Park
FOUNDRY and MACHINE CO.
HYDE PARK
Westmoreland County, Pa.

Rolls
Rolling Mill Equipment
Gray Iron Castings



one call from you . . . and they're on your staff!

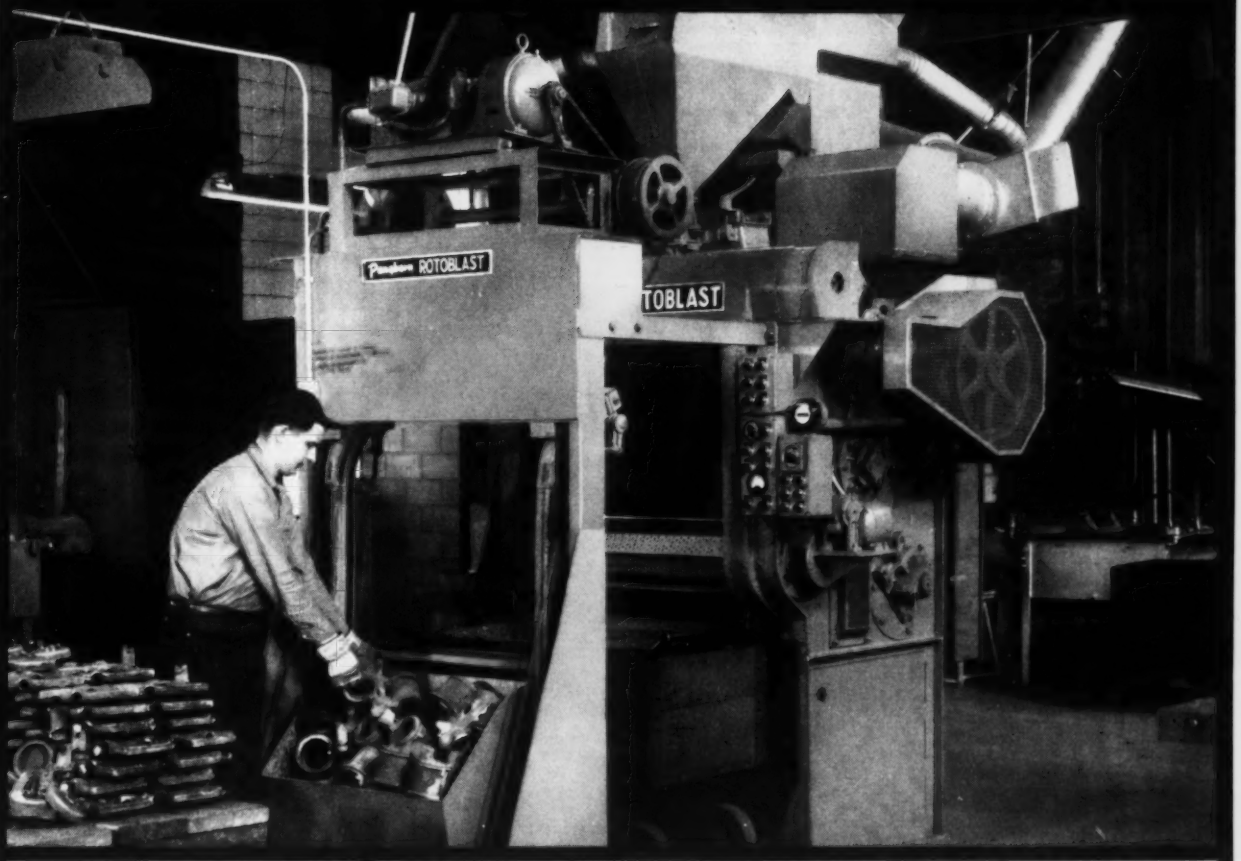
And they'll bring with them a nearby source of Carpenter tool, stainless and alloy steels. Actually they form just one station in a network that has built itself into a large chain of service-centers by offering and delivering the steels you need when you need them. Make that one action-getting call now. It will pay off in new operating flexibility for you. Just like having a complete warehouse in your own plant. The Carpenter Steel Company, 139 W. Bern Street, Reading, Pa.

Carpenter

mill-branch warehouse service

mill-branch warehouses, offices and distributors in principal U. S. cities consult your local telephone directory

ROTOBLAST CUTS CLEANING TIME 70%!



Pangborn Rotoblast reduces cleaning time from 15 minutes per load to 4½ minutes at Buckeye Iron & Brass

To reduce costs and still keep up production schedules, Buckeye Iron & Brass Works, Dayton, Ohio, replaced its centrifugal blast cleaning barrel (which is still in good operating condition) with an automated 6′ Pangborn Rotoblast Barrel. Result: Cleaning time was cut from 15 to 4½ minutes per load!

Through automation, the Rotoblast Barrel has also saved the company the cost of one full-time operator and has proved economical in terms of maintenance. In seven months, no repairs or replacements, other than vanes, have been necessary!

For details on how Pangborn Rotoblast can save you money, write for Bulletin 706 to PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning and Dust Control Equipment—Rotoblast Steel Shot and Grit.*

Pangborn

CLEANS IT FAST WITH ROTOBLAST®

PROOF OF DEPENDABILITY

Cutler-Hammer Control sets new performance records at West Virginia Pulp & Paper Company

In the West Virginia Pulp & Paper Co. plant mechanized for the high volume production of multi-wall paper bags, the plant electrician has reported, "About two years ago we installed a Cutler-Hammer Reversing Starter on one of our bag machines and we thought you might be interested in our experience with this control.

"Because of the nature of the operation, the motor averages 48 reversals per minute. During the past two years this starter has operated with complete satisfaction . . . and is still operating satisfactorily. But more important the control hasn't required any time or attention . . . no production time lost because of a control failure. And this is a record with us because the best service we could get from other controls used was about 2½ months before failure during which time the control required frequent repairs to keep it in operation."

This is positive proof of dependability . . . proof that Cutler-Hammer Three-Star Motor Control works better, lasts longer than any other on the market today. Why take chances with production interruptions? Order dependable Cutler-Hammer Three-Star Motor Control from your nearby Authorized Cutler-Hammer Distributor today. For complete ordering information write for the Cutler-Hammer Merchandiser Pub. EA-100-L213.

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